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The Old West Regional Commission
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USDA Forest Service, Surface
Environment and Mining

Billings, Montana

ENERGY RESEARCH INFORMATION SYSTEM

Quarterly Report

Vol. 1, No. 2
February 1976

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ENERGY RESEARCH INFORMATION SYSTEM

QUARTERLY REPORT

Vol. 1, No. 2

Old West Regional Commission
and
USDA Forest Service, Surface Environment and Mining

Billings, Montana
February 1976

Prepared by:

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TABLE OF CONTENTS

Introduction i

Reporting Form iii

Amendments 1A

1.0 Coal 1

- 1.1 General 1
- 1.2 Reclamation 3
- 1.3 Water Resources 10
- 1.4 Atmospheric & Bioenvironmental Studies 17
- 1.5 Social & Economic Studies 23
- 1.6 Energy Conversion & Transport 27
- 1.7 Mining & Extraction Methodology 33

2.0 Petroleum, Natural Gas and Oilshale 34

3.0 Alternate Energy Sources 35

6.0 Energy Conservation/Consumer Aspects 36

7.0 Land Use 37

8.0 Other 39

Location Index 43

Personal Name Index 44

Organization Index 54

Subject Index 62

INTRODUCTION

The Energy Research Information System (ERIS) is a cooperative program of the Old West Regional Commission (OWRC) and the U.S. Forest Service, Surface Environment and Mining (SEAM). The Old West Regional Commission is a Federal-State partnership whose function is to stimulate programs for orderly economic growth and development in the states of Montana, Nebraska, North Dakota, South Dakota, and Wyoming. Established in 1972 under the Public Works and Economic Development Act of 1965, it is one of seven such Commissions in the United States. Its offices are located in Washington, D.C., Rapid City, South Dakota, and Billings, Montana. The SEAM program provides and applies technology in order to maintain or restore the quality of the environment and surface values of forests and rangelands subject to mining. The SEAM office is also located in Billings, Montana.

The objective of ERIS is to compile and make available to the energy research users of the Region an up-to-date inventory of ongoing and recently completed energy-related research projects. By providing researchers with a means of communication with other researchers and allowing government and policy decision-makers access to Regional energy research, ERIS aims to improve communication channels among energy research users. Use of the system can be an aid in avoiding research duplication and pinpointing areas of additional research need.

ERIS Scope

The term "energy-related" covers a broad spectrum of activities and encompasses a large volume of research. Nonetheless, ERIS attempts to report energy-related research projects in as comprehensive a manner as possible. This includes reclamation, energy conversion, and land use research, socioeconomic impact and alternate energy resource studies, as well as programs related to energy development which do not necessarily involve research.

The geographic focus of ERIS is upon research conducted in the Old West Region. Research outside of the Region is included when it is offered by the reporting agency as being applicable to research efforts or developments within the Region.

The first Quarterly Report of system holdings was issued November, 1975. It contains abstracts of 300 energy-related research projects. Subsequent Quarterly Reports serve not only to update the system on newly funded projects, but also to fill in the gaps on ongoing and recently completed projects not previously reported.

The compilation of energy research projects in the Quarterly Reports has been accomplished by combining ERIS's own information-gathering efforts with those of other clearinghouses - most notably, the Oak Ridge National Laboratory's "Inventory of Current Energy Research and Development," the Montana Energy Advisory Council, and the other various energy agencies of Wyoming, North Dakota, Nebraska, and South Dakota.

Use of the ERIS Quarterly Report

Chapter Breakdowns

The research projects included in the Quarterly Reports are categorized by broad subject areas, or chapters. For example, coal research is broken down into eight chapters dealing with specific subjects such as Reclamation, Water Resources, and Social and Economic Studies.

Indexes

In addition, further access is provided by four indexes - location, personal name, organization, and subject. The following are suggestions which may help you in the use of the indexes:

The Location Index utilizes the 2-letter abbreviations for states' names, i.e. MT for Montana, WY for Wyoming, and so forth.

The Personal Name Index contains the personal names of the investigators, supervisors, project monitors, and authors of publications for each project.

The Organization Index contains uniform names of all organizations included in the main body of ERIS. Government agencies listed in the Organization Index are prefaced by the organization's affiliation, for example, *South Dakota* Office of Energy Policy, and *U.S.* Forest Service, Surface Environment and Mining.

The Subject Index is the keyword list that is also used in conducting computer searches. If a user wishes to conduct a manual search of the system using the Subject Index, it is recommended that a combination of general and specific terms be used. As an example, if the user is trying to identify all projects on the effects of mining on the rangeland environment, the user should consult "range ecology," but may find additional references under the broad term "bioenvironment."

In addition to subject terms, the Subject Index contains specific program names, such as *Project Lignite*, and location names, such as *Powder River Basin*.

Amendments

Each Quarterly Report subsequent to the first issue contains an Amendments chapter. When reported by information contributors, this chapter records major changes in research project information. It also serves as a notice of completed research projects in which reports and publications are available.

Computer Search Service

The holdings of ERIS are computerized, allowing for flexibility in conducting special searches of the data file. Each of the data categories in the Reporting Form (reproduced on the following pages) or any combination of categories can be used to formulate a computer search. Subject searches can be conducted using assigned *keywords* and by scanning the abstract and title on a *free text* basis.

The computer search service is offered as a complement to the Quarterly Reports. If your inquiry concerning energy research cannot be answered by manual use of the Quarterly Report, contact a member of the ERIS staff and request that a computer search be conducted. The time involved in performing the search, compiling the projects and mailing is anticipated to be one week.

Please direct your inquiries to: Beth Givens or Cathy Boyd, ERIS, Old West Regional Commission, Fratt Bldg. Suite 306A, Billings, Mt 59101. 406-245-6711 x6665 (commercial) or 585-6665 (FTS).

REPORTING FORM:
ENERGY RESEARCH INFORMATION SYSTEM
Old West Regional Commission

Date ____________

Respondent:

Please complete the relevant categories of the Reporting Form for each energy-related project currently being conducted or recently completed by your organization. If an umbrella project covers several separate studies, fill out a form for each one, as well as for the umbrella project. If you want any of the information you provide to be omitted from Information System publications, make a note of this in Category 16, "Special Instructions for Proprietary Information."

In order to assist us in assigning keywords for computer access to your research information, we ask that you circle the most descriptive words and phrases of the Title and Abstract. Suggest additional terms in Category 14, "Abstract," as you deem necessary.

If you are amending previously submitted information, please note this on the Reporting Form.

PLEASE RETURN COMPLETED REPORTING FORM(S) TO: Beth Givens, Old West Regional Commission, Fratt Bldg. 306A, Billings, MT 59101. If you have questions or need additional Reporting Forms, please contact us. Our phone number is: 406-245-6711 x6665 (commercial) or 585-6665 (FTS).

We sincerely appreciate your cooperation in this effort.

---

1. KW (please leave blank)

2. Project/Program Title (please circle key words) ____________

3. Project/Program Number (descriptive no. used by your organization) ____________

4. Principal Investigators (include organization name & address if different from 5 below)

Investigator ____________ Phone Number ______ ______

Organization ____________

Address ____________

Investigator ____________ Phone Number ______ ______

Organization ____________

Address ____________

5. Project Supervisor (individual and organization which oversee all facets of project or program through its completion)

Supervisor ____________ Phone Number ______ ______

Organization ____________

Address ____________

6. Other Coordinating and Cooperating Organizations

Coordinator (organization whose function is to coordinate research of other entities by subcontracting and/or supervising said research; does not provide primary source funding and may or may not conduct the research itself)

Project Monitor ______________________ Phone Number______ __________

Organization ____

Address ____

____

Cooperator(s) (organization(s) which provide(s) time and/or resources toward the project but does not conduct, supervise, or fund the research)
Please provide organization name(s) below:

7. Primary Sponsor (organization which provides funds)

Project Monitor ______________________ Phone Number______ __________

Organization ____

Address ____

____

8. Secondary Sponsor

Project Monitor ______________________ Phone Number______ __________

Organization ____

Address ____

____

9. Primary Funding Amount (please complete A and, *if applicable*, one section of B)

A. Total amount: $__________ for ______ yrs. ______ mos.

B. Amount per year: $__________ per yr. for ______ yrs. beginning ______ ______ ______
mo. day yr.

OR $__________ for the yr. ________ $__________ for the yr. ________

$__________ for the yr. ________ $__________ for the yr. ________

10. Secondary Funding Amount (please complete A and, *if applicable*, one section of B)

A. Total amount: $__________ for ______ yrs. ______ mos.

B. Amount per year: $__________ per yr. for ______ yrs. beginning ______ ______ ______
mo. day yr.

OR $__________ for the yr. ________ $__________ for the yr. ________

$__________ for the yr. ________ $__________ for the yr. ________

11. Time Frame: Starting Date ____ ____ ____ (mo. day yr.) Ending Date ____ ____ ____ (mo. day yr.)

12. Status: Actual Completion Date of Project (leave blank if not completed)

____ ____ ____ (mo. day yr.)

13. Location: States and, *if appropriate*, Region, River Basin, Counties, Cities, Township/Range/Section, etc.

States ____________________

Other ____________________

14. Abstract: Problem, Objectives, and Approach (in free form, 300 words maximum) *PLEASE CIRCLE KEY WORDS AND PHRASES. Add additional terms as you deem necessary.*

15. Reports and Publications of This Study Available to the Public (title, authors, report number, date, issuing agency, and where report can be obtained)

16. Special Instructions for Proprietary Information (enter category number and information which you desire to be omitted from published materials)

17. Type of Study (please check all that apply)

- I. ☐ Primary Data Sources
  - A. ☐ Field Study
  - B. ☐ Lab. Study
  - C. ☐ Both A and B
- II. ☐ Secondary Data Sources
- III. ☐ Both I and II
- IV. ☐ Program Not Involving Research (for example, an energy-related community assistance program)
- V. A. ☐ The study described on this Reporting Form is an umbrella project or program. It encompasses two (2) or more separate studies which are subcontracted and/or of differing subject content. *(Please provide Reporting Forms for the separate projects* or *incorporate them onto this Reporting Form.)*
  - B. ☐ The study described on this Reporting Form is a part of an umbrella project or program entitled:

    ____

    ____

    (The Cooperator is recorded in Category 6, above.)
  - C. ☐ The study is a separate project or program in and of itself.

Thank you for completing this Reporting Form. Please call or write if you have questions.

AMENDMENTS

*****

00000002

PROJECT TITLE:
AN ASSESSMENT OF COAL DEVELOPMENT IN WESTERN SOUTH DAKOTA

PROJECT NUMBER:
057

INVESTIGATORS:
NEAL JACQUOT

PROJECT SUPERVISOR:
LARRY FINNERTY
SOUTH DAKOTA SIXTH DISTRICT COUNCIL OF LOCAL GOVERNMENTS
BOX 1586
RAPID CITY, SD 57701

COORDINATOR:
SOUTH DAKOTA STATE PLANNING BUREAU
HARLEY DUNCAN
CAPITOL BLDG
PIERRE, SD 57501

PRIMARY SPONSOR:
OLD WEST REGIONAL COMMISSION
PHIL BROOKS
201 MAIN ST SUITE D
RAPID CITY, SD 57701

PRIMARY FUNDING AMOUNT:
FY 75 - 7,000 ; FY 76 - 6,500

SECONDARY FUNDING AMOUNTS:
FY 75 - 4,875

TIME FRAME:
06 01 74 TO 05 31 76

LOCATION:
SD - REGION OF THE SIXTH DISTRICT, WESTERN SD

ABSTRACT:

GRANTEE SHALL ASSESS INFORMATION AND RESEARCH COAL MINING AND RELATED DEVELOPMENTS FROM INFORMATION AVAILABLE FROM STATE AND FEDERAL AGENCIES TO INCLUDE: 1. THE INTERIM REPORT AND WORK GROUP REPORTS OF NORTHERN GREAT PLAINS RESOURCES PROGRAM; 2. RESEARCH FUNDED BY OLD WEST REGIONAL COMMISSION; 3. RESEARCH CONDUCTED BY FEDERAL AGENCIES INCLUDING EPA, USGS, NSF, DEPT. OF AGRICULTURE, AND BUREAU OF RECLAMATION.

GRANTEE SHALL DETERMINE PLANS OF COMPANIES WITH RESPECT TO: 1. COAL DEVELOPMENT; 2. STEAM ELECTRIC GENERATING PLANTS; 3. COAL GASIFICATION; 4. WATER WITHDRAWALS IN DISTRICT.

GRANTEE SHALL REPORT TO PUBLIC STATEMENT OF COAL IMPACT ON AIR QUALITY, WATER QUALITY AND QUANTITY, AND USE AND SOCIOECONOMIC IMPACT.

GRANTEE SHALL OUTLINE AREAS WHERE CURRENT RESEARCH IS DEFICIENT.

THE PRIMARY OBJECT OF THE TWO PHASES OF THE STUDY DOCUMENT IS TO MEASURE THE IMPACT OF COAL DEVELOPMENT ON WESTERN SOUTH DAKOTA

PHASE I, COMPLETED IN JUNE 1975, WAS A PRELIMINARY ASSESSMENT OF THE COAL ACTIVITY IN THE NORTHERN GREAT PLAINS REGION, AND HOW IT MAY AFFECT THE SIXTH DISTRICT.

PHASE II, AN EXTENSION OF THE FIRST PHASE INCLUDING UP TO DATE ACTIVITY OF IMPACT AND GROWTH OF COAL DEVELOPMENT, IS TO BE COMPLETED IN MID 1976.

REPORTS AND PUBLICATIONS:
THE IMPACT OF COAL DEVELOPMENT. SIXTH DISTRICT COUNCIL OF LOCAL GOVERNMENTS. JULY, 1975. P.O. BOX 1586 RAPID CITY, SD 57701

*****

00000012

PROJECT TITLE:
POTENTIAL OF COAL STRIP MINE FILLS AS AQUIFERS IN THE POWDER RIVER

PROJECT NUMBER:
10470025 (OWRC) - 2302 (SDSM&T)

INVESTIGATORS:
PERRY H. RAHN

PROJECT SUPERVISOR:
NORMAN ORAVA
SOUTH DAKOTA SCHOOL OF MINES & TECH., DEPT. OF ENG.
RAPID CITY, SD 57701

PRIMARY SPONSOR:
OLD WEST REGIONAL COMMISSION
WILLIAM FOGARTY
FRATT BLDG, SUITE 306A
BILLINGS, MT 59101

PRIMARY FUNDING AMOUNT:
80,600

TIME FRAME:
07 01 74 TO 06 30 76

LOCATION:
WY MT - POWDER RIVER BASIN

ABSTRACT:

LARGE QUANTITIES OF STRIP-MINE WASTE WILL ULTIMATELY BE REPLACED IN MINED OUT AREAS IN THE POWDER RIVER BASIN, WYOMING AND MONTANA. THIS STUDY CONCERNS THE HYDROLOGIC CHARACTERISTICS OF THE WASTE, AND THE CHEMISTRY OF THE WATER WHICH OCCURS IN THE SPOILS.

PRELIMINARY OBSERVATIONS INDICATE THAT THE POROSITY OF STRIPPED OVERBURDEN INCREASES WHEN IT IS DUMPED AS SPOILS. THE PERMEABILITY OF THE SPOILS VARIES GREATLY FROM MINE TO MINE AND DEPENDS IN PART ON THE LOCAL STRATIGRAPHY. PERMEABILITY IS LOW WHERE THE OVERBURDEN IS SHALE WITH INTERBEDDED SANDSTONE, SUCH AS AT THE DECKER, MONTANA, OR AT THE DAVE JOHNSTON MINE AT GLENROCK, WYOMING. PERMEABILITY IS HIGH WHERE THE OVERBURDEN IS MOSTLY ALLUVIUM, SUCH AS AT THE WYODAK AND BELLE AYR MINES AT GILLETTE AND AT THE BIG HORN MINE AT SHERIDAN, WYOMING. THE PERMEABILITY OF THE SPOILS ALSO DEPENDS ON THE MECHANICAL EQUIPMENT USED IN REMOVING AND TRANSPORTING THE OVERBURDEN. DRAGLINE-DUMPED SPOILS ARE LOOSER AND HAVE GREATER PERMEABILITY THAN SCRAPER-DUMPED SPOILS, PRESUMABLY DUE TO THE COMPACTION BY THE HEAVY SCRAPER TIRES. THIS SUGGESTS THAT IF A PERMEABLE SPOILS DEPOSIT IS A DESIRED END PRODUCT OF STRIP-MINING, THEN DRAGLINE EXCAVATION IS PREFERABLE TO SCRAPER EXCAVATION.

TWENTY-ONE WATER SAMPLES COLLECTED FROM LOCAL SHALLOW GROUND WATER AND FROM OLD SPOILS AREAS WERE ANALYZED FOR CHEMICAL CONSTITUENTS. ALL SAMPLES HAD GREATER THAN 250 PPM SULFATE, THE UPPER DRINKING WATER LIMIT RECOMMENDED BY THE U.S. PUBLIC HEALTH SERVICE. THE SAMPLES WERE ALSO HIGH IN CALCIUM, MAGNESIUM, AND TOTAL DISSOLVED SOLIDS.

WATER TABLE LEVELS INDICATE THAT THE SPOILS AT THE WYODAK, BELLE AYR, BIG HORN, AND DECKER MINES WILL BECOME SATURATED TO VARYING DEGREES UPON ABANDONMENT. WHERE THESE SPOILS ARE PERMEABLE, THEY WILL BECOME MAN-MADE AQUIFERS--AN INADVERTENT BENEFICIAL END-PRODUCT OF STRIP MINING.

REPORTS AND PUBLICATIONS:
PERRY H. RAHN. GROUND WATER IN COAL STRIP-MINE SPOILS. MONTANA ACADEMY OF SCIENCES PROCEEDINGS, FORT UNION COAL FIELD SYMPOSIUM, APRIL 25-26, 1975, PP.348-361.

*****

00000097

PROJECT TITLE:
RECONNAISSANCE TECHNIQUES FOR EVALUATION OF REHABILITATION POTENTIAL OF ENERGY RESOURCE LANDS

PROJECT NUMBER:
CR75-104

INVESTIGATORS:
LYNN M. SHOWN; R. F. MILLER; I. S. MCQUEEN; C. T. TANKERSLEY; F. A. BRANSON

PROJECT SUPERVISOR:
RICHARD F. HADLEY, CHIEF, PUBLIC LANDS HYDROLOGY PROGRAM
U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.
STOP 412, BOX 25046 DENVER FEDERAL CENTER
DENVER, CO 80225

PRIMARY SPONSOR:
U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.

SECONDARY SPONSORS:
U.S. BUREAU OF LAND MANAGEMENT
R. L. KUHLMAN
BLDG 50, DENVER SERVICE CENTER, DENVER FED. CENTER
DENVER, CO 80225

PRIMARY FUNDING AMOUNT:
FY 76 - 36,200

SECONDARY FUNDING AMOUNTS:
FY 76 - 127,590

TIME FRAME:
07 01 74 TO 09 30 79

LOCATION:
MT ND WY

ABSTRACT:
PROBLEM: HYDROLOGIC INFORMATION WITH RESPECT TO REHAPILITATION POTENTIAL IS NEEDED BY LOCAL, STATE AND FEDERAL GOVERNMENTS, PRIVATE LANDOWNERS, ENERGY COMPANIES AND OTHERS PRIOR TO THE GRANTING OF LEASES, THE APPROVAL OF MINING PLANS, AND THE ACTUAL MINING OF PUBLICLY OWNED COAL. THE INFORMATION IS NEEDED OVER THE NEXT ONE TO FIVE YEARS, SO RECONNAISSANCE TECHNIQUES MUST BE USED TO OBTAIN MUCH OF THE NECESSARY DATA. THE TWO FACETS OF THE PROBLEM ARE: 1. TO DEFINE THE BASELINE CONDITIONS AS THEY EXIST PRIOR TO MINING MOSTLY IN AREAS HAVING SPARSE HYDROLOGIC DATA, AND 2. TO ASSESS THE POTENTIAL FOR REHABILITATION OF THE LAND-WATER SYSTEM AFTER MINING.
OBJECTIVES: THE PURPOSE OF THIS PROJECT WILL BE TO REFINE AND APPLY RECONNAISSANCE TECHNIQUES THAT WILL PROVIDE MAPABLE AND OTHER EASILY ASSIMILATED INFORMATION TO BE USED AS BASELINE DATA AND IN EVALUATING THE REHABILITATION POTENTIAL OF LANDS WHERE ENERGY RESOURCE MINING IS PROPOSED. DATA WILL BE COLLECTED AND INTERPRETED FOR THE FOLLOWING SUBJECTS: MEAN ANNUAL RUNOFF, 2-, 5- AND 10-YEAR PEAK FLOWS, SOIL ERODIBILITY, ANNUAL SEDIMENT YIELDS, SOIL-VEGETATION-WATER ASSOCIATIONS, EVAPOTRANSPIRATION, SLOPE AND EXPOSURE EFFECTS ON VEGETATION AND HYDROLOGY, RECONSTRUCTION OF TOPOGRAPHY AFTER ASSUMED MINING, AND CHANNEL AND HILLSLOPE EROSION.
APPROACH: THE TECHNIQUES TO BE USED TO CHARACTERIZE WATERSHEDS OF VARIOUS SIZES ARE: 1. SOIL-MOISTURE STORAGE ASSOCIATED WITH VEGETATION TYPES; 2. ESTIMATES OF ANNUAL RUNOFF BY SUBTRACTING SOIL-MOISTURE STORAGE FROM ANNUAL PRECIPITATION; 3. THE RELATION OF PERCENT BARE SOIL TO RUNOFF AND SEDIMENT YIELD; 4. INDEX OF ERODIBILITY BY WATER DISPERSION; 5. ESTIMATES OF ANNUAL RUNOFF AND PEAK DISCHARGES USING CHANNEL MEASUREMENTS; 6. ESTIMATES OF SEDIMENT YIELD USING CLIMATE, DRAINAGE BASIN CHARACTERISTICS AND RESERVOIR SEDIMENT SURVEYS; 7. EROSION MONITORING BY RE-SURVEYING MONUMENTED TRANSECTS; 8. HILLSLOPE, CHANNEL AND GEOLOGIC CROSS-SECTION ANALYSIS WITH RESPECT TO RECONSTRUCTION OF THE TOPOGRAPHY OF POTENTIAL MINE AREAS. SOILS, VEGETATION AND RUNOFF AND EROSION OF NEARBY MINE SPOILS WILL BE INVESTIGATED.

TYPE OF STUDY:
PART OF 'PUBLIC LANDS HYDROLOGY PROGRAM,' U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.

REPORTS AND PUBLICATIONS:
U.S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY. 1975. SEDIMENT YIELDS, P. 110-119; VEGETATION, SOIL MOISTURE RETENTION AND SOIL ERODIBILITY, CHARACTERISTICS, P. 120 - 142, IN USDI, BUREAU OF LAND MANAGEMENT, RESOURCE AND POTENTIAL RECLAMATION EVALUATION--HANNA BASIN STUDY SITE, EMRIA REPORT NO. 2, 176 PP. AVAILABLE AT: BLM DISTRICT OFFICE; 1300 THIRD STREET, P.O. BOX 670; RAWLINS, WYOMING 82301
U.S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY. 1975. VEGETATION, SOIL-MOISTURE-RETENTION CHARACTERISTICS AND SOIL ERODIBILITY, P. 126 - 148; SEDIMENT YIELDS, P. 149 - 155, IN USDI, BUREAU OF LAND MANAGEMENT, RESOURCE AND POTENTIAL RECLAMATION EVALUATION--OTTER CREEK STUDY SITE, EMRIA REPORT NO. 1, 200 PP. VEGETATION, SOIL-MOISTURE-RETENTION CHARACTERISTICS ETC. AVAILABLE AT: BUREAU OF LAND MANAGEMENT MONTANA STATE OFFICE; FEDERAL BUILDING; 316 NORTH 26TH STREET; BILLINGS, MONTANA 59101

*****

00000132
PROJECT TITLE:
SLAGGING FIXED-BED COAL GASIFICATION
PROJECT SUPERVISOR:
R. C. ELLMAN
U.S. ERDA, GRAND FORKS ENERGY RESEARCH CENTER
GRAND FORKS, ND 58202
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
FY 75 - 180,000 ; FY 76 - 600,000
TIME FRAME:
07 01 74 TO 06 30 80
LOCATION:
ND
ABSTRACT:
THE OBJECTIVES OF THIS PROJECT ARE: TO OPERATE A FIXED-BED SLAGGING COAL GASIFICATION UNIT OF ABOUT 1-TPH CAPACITY; TO STUDY THE EFFLUENTS PRODUCED DURING OPERATION WITH LIGNITE AND OTHER LOW-RANK COALS; TO DEVELOP METHODS TO REDUCE ADVERSE ENVIRONMENTAL EFFECTS AND WATER USAGE; TO DETERMINE GASIFICATION CHARACTERISTICS OF SELECTED WESTERN COALS; AND TO DEVELOP TECHNIQUES TO REDUCE OR REMOVE LIMITATIONS OF FEED SIZE CONSIST AND MOISTURE CONTENT IN FIXED-BED GASIFICATION SYSTEMS.

*****

00000133
PROJECT TITLE:
CONTROL OF ASH FOULING IN COMBUSTION OF WESTERN COALS
PROJECT SUPERVISOR:
E. A. SONDREAL; P. H. TUFTE
U.S. ERDA, GRAND FORKS ENERGY RESEARCH CENTER
GRAND FORKS, ND 58202
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
FY 73 - 148,000 ; FY 74 - 110,000 ; FY 75 - 250,000 ;
FY 76 - 250,000
TIME FRAME:
07 01 65 TO 06 30 79
LOCATION:
ND
ABSTRACT:
DEVELOPMENT OF INFORMATION ON FIRESIDE ASH FOULING TO IMPROVE THE THERMAL EFFICIENCY AND AVAILABILITY OF STEAM GENERATORS BURNING WESTERN U.S. COALS. DEVELOPMENT OF DETAILED INFORMATION ON THE ASH CHARACTERISTICS OF WESTERN COALS; MEASUREMENTS OF RATES OF ASH BUILD-UP IN A LABORATORY FURNACE BURNING SELECTED COALS; AND ESTABLISHMENT OF THE MECHANISMS WHEREBY RAPID FOULING OCCURS TO DEVELOP NEW METHODS OF FIRESIDE ASH FOULING CONTROL.
REPORTS AND PUBLICATIONS:
P. H. TUFTE, W. BECKERING. A PROPOSED MECHANISM OF ASH FOULING IN BURNING NORTHERN GREAT PLAINS LIGNITE. PRESENTED AT THE ANNUAL MEETING OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, NOVEMBER 1974, NEW YORK; PREPRINT AVAILABLE.

*****

00000135
PROJECT TITLE:
INVESTIGATION OF THE BIOENVIRONMENTAL IMPACT OF FOSSIL FUEL POWER PLANTS IN THE FORT UNION BASIN, MT
PROJECT NUMBER:
EPA R803215-02-0
PROJECT SUPERVISOR:
C. C. GORDON
UNIV. OF MONTANA, DEPT. OF BOTANY, ENVIRONMENTAL STUDIES LAB.
MISSOULA, MT 59801
PRIMARY SPONSOR:
U.S. EPA, CORVALLIS NAT. ENV. RESEARCH CENTER
200 SW 35TH ST.
CORVALLIS, OR 97330
PRIMARY FUNDING AMOUNT:
1975 - 46,000 ; 1976 - 80,000
TIME FRAME:
06 01 74 TO 09 30 76
LOCATION:
MT - FORT UNION BASIN
ABSTRACT:
THE PURPOSES OF THIS STUDY ARE TO ASSESS THE EFFECTS OF COAL-FIRED STEAM ELECTRIC POWER GENERATION ON FUNGAL AND INSECT POPULATIONS, ON PRECIPITATION CHEMISTRY, AND ON VEGETATION IN THE VICINITY OF COLSTRIP, MONTANA. STUDIES ARE BEING CONDUCTED ON GRASSLANDS EXCLOSURES WHICH WILL BE IMPACTED BY THE POWER PLANT AND ON GRASSLAND EXCLOSURES TO BE STRESSED WITH SO(2) FUMIGATION AND WHICH IS OUTSIDE THE MAIN IMPACT AREA. CHEMICAL ANALYSES HAVE BEEN PERFORMED ON VEGETATION FROM ALL EXCLOSURES AND WILL BE CONTINUED. FUNGI HAVE BEEN CULTURED AND NATIVE VEGETATION WILL BE INNOCULATED AT ALL EXCLOSURES. INSECT SURVEYS HAVE BEEN CONDUCTED AT EXCLOSURES AND ON SURROUNDING AREAS. DAMAGE TO PINES BY INSECTS IS BEING ASSESSED. FOREST INSECT PESTS WILL BE CULTURED AND STRESSED BY SO(2) FUMIGATION. STUDIES DESIGNED TO DETERMINE THE EFFECTS OF SO(2) ON BEES WILL BE CONDUCTED AT SITES WHICH ARE TO BE STRESSED BY SO(2) FUMIGATION

AND FROM NATIVE HIVES IN THE HIGH IMPACT AREAS. CHEMICAL ANALYSES FOR FLUORIDE AND SULFUR DIOXIDE HAVE BEEN PERFORMED AND WILL BE CONTINUED ON BEES COLLECTED IN THE COLSTRIP AREA.
ACTIVITIES OF THE SECOND YEAR OF THE 3-YEAR STUDY INCLUDE:
1. CONTINUATION OF A SURVEY STUDY OF THE INSECT AND FUNGAL POPULATIONS, INFESTATION, AND DAMAGE TO SPECIES OF INDIGENOUS PLANTS AT THE SEVEN NERL SITES AND THE 15 PONDEROSA PINE SUPPLEMENTARY SITES.
2. CONTINUATION OF THE ANALYSIS AND SELECTION OF INDIGENOUS PLANT SPECIES WHICH HAVE A DIVERSIFIED BUT UNDERSTANDABLE INTERRELATIONSHIP WITH SELECTED INSECT AND FUNGAL SPECIES COLLECTED FROM THE STUDY SITES.
3. CONTINUATION OF SELECTING AND TESTING OF DESTRUCTIVE AND BENEFICIAL FUNGAL AND INSECT SPECIES USED FOR DETERMINING BIOENVIRONMENTAL IMPACTS OF THE EMISSIONS OF FOSSIL FUEL-FIRED POWER PLANTS ON THESE FUNGAL AND INSECT SPECIES AND THEIR RELATIONSHIP TO PLANT SPECIES.
4. CONTINUATION OF CHEMICAL ANALYSIS OF THOSE INDIGENOUS PLANTS AND INSECTS WHICH ARE BEING UTILIZED FOR INTENSIVE INVESTIGATION OF THE POTENTIAL IMPACT OF THE EMISSIONS OF FOSSIL FUEL-FIRED POWER PLANTS.
5. CONTINUATION OF STUDIES ON THE GROWTH OF PONDEROSA PINE TREES AT SITES WITH HIGH PROBABILITY OF BEING IMPACTED BY THE EMISSIONS OF THE COLSTRIP UNITS #1 AND #2 COAL-FIRED POWER PLANTS: (A) TO QUANTIFY ANNUAL NEEDLE AND STEM GROWTH; (B) TO QUANTIFY, THROUGH GROWTH RING ANALYSIS, THE ANNUAL GROWTH OF THE STUDY TREES FOR THE LAST 25 TO 30 YEARS; (C) TO CARRY OUT CHLOROPHYLL ANALYSIS OF THE DIFFERENT YEARS' NEEDLE GROWTH; (D) TO QUANTIFY NEEDLE RETENTION TIME, AND DISEASE AND INSECT DAMAGE AND INFESTATION INDICES FOR THE PONDEROSA PINE TREES AT THE SELECTED STUDY SITES.

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00000165
PROJECT TITLE:
EFFECTS OF SO2 AND OTHER COAL-FIRING PLANT EMISSIONS ON PRODUCER, INVERTEBRATE CONSUMER AND DECOMPOSER STRUCTURE AND FUNCTION IN AN EASTERN MONTANA GRASSLAND
INVESTIGATORS:
WILLIAM K. LAUENROTH; ROBERT WOODMANSEE
PROJECT SUPERVISOR:
J. L. DODD
COLORADO STATE UNIV., NATURAL RESOURCE ECOL. LAB.
FT. COLLINS, CO 80523
PRIMARY SPONSOR:
U.S. EPA, CORVALLIS NAT. ENV. RESEARCH CENTER
ERIK PRESTON
CORVALLIS, OR 97330
PRIMARY FUNDING AMOUNT:
TOTAL 560,000
1974 - 75,000 ; 1975 - 125,000 ; 1976 - 160,000 ;
1977 - 200,000
TIME FRAME:
04 01 74 TO 04 01 78
LOCATION:
MT - FORT UNION BASIN NEAR ASHLAND AND COLSTRIP
ABSTRACT:
THE OBJECTIVES OF THE STUDY ARE THREEFOLD. ONE ARRAY OF OBJECTIVES RELATES TO THE CONTROLLED STRESS STUDY WHERE FOUR LEVELS OF GASEOUS SO2 (AMBIENT, 2, 5, 10 PPHM) ARE BEING APPLIED TO SEPARATE ONE-ACRE STUDY PLOTS LOCATED ON THE GRASSLANDS OF CUSTER NATIONAL FOREST. THE OBJECTIVES ARE TO DETERMINE THE EFFECTS OF SO2 ON THE SEASONAL BIOMASS DYNAMICS OF THE PRODUCER AND INVERTEBRATE CONSUMER COMPONENTS AND ON DECOMPOSITION RATES.
THE SECOND ARRAY OF OBJECTIVES RELATES TO BASELINE MONITORING OF FOUR GRASSLAND STUDY SITES NEAR THE COAL-FIRING POWER PLANT AT COLSTRIP, MONTANA. IT IS EXPECTED THAT THESE AREAS WILL BE EXPOSED TO DIFFERING INTENSITIES OF ATMOSPHERIC POLLUTION FROM THE COLSTRIP FIRING PLANT. THE OBJECTIVES FOR 1974 AND 1975 WERE TO CHARACTERIZE DECOMPOSITION RATES AND THE SEASONAL BIOMASS DYNAMICS OF THE PRODUCER AND INVERTEBRATE CONSUMER COMPONENTS OF EACH OF THESE ECOSYSTEMS IN THE TWO SEASONS PRIOR TO THEIR FIRST EXPOSURE TO EMISSIONS FROM THE COAL-FIRING PLANT.
THE THIRD ARRAY OF OBJECTIVES FOR THE STUDY ARE THOSE PERTAINING TO THE ADAPTATION OF THE NERL ECOSYSTEM LEVEL MATHEMATICAL MODEL TO THE GRASSLAND TYPE STUDIED IN THE ABOVE MENTIONED STUDY AREAS. THE MODEL IS A SIMULATION MODEL BASED ON ECOLOGICAL PROCESSES. THE MECHANICS OF THE MODEL WILL BE ALTERED TO ALLOW SIMULATION OF THE EASTERN MONTANA GRASSLAND UNDER STRESS FROM ATMOSPHERIC POLLUTANTS.
TYPE OF STUDY:
PART OF 'THE BIOENVIRONMENTAL IMPACT OF A COAL-FIRED POWER PLANT,' U.S. ENVIRONMENTAL PROTECTION AGENCY
REPORTS AND PUBLICATIONS:
A. INTERIM AND PROGRESS REPORTS HAVE BEEN SUBMITTED TO ENVIRONMENTAL PROTECTION AGENCY. CONTACT DR. ERIK PRESTON, U.S. EPA, CORVALLIS NERL.
LAUENROTH, W. K., J. L. DODD, P. K. HEITSCHMIDT, AND R. G. WOODMANSEE. 1975. BIOMASS DYNAMICS AND PRIMARY PRODUCTION IN MIXED PRAIRIE GRASSLANDS IN SOUTHEASTERN MONTANA: BASELINE DATA FOR AIR POLLUTION STUDIES. FORT UNION COAL FIELD SYMPOSIUM. MONT. ACAD. SCI. APRIL, 1975.

1.4 ATMOSPHERIC AND BIOENVIRONMENTAL STUDIES

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00000168
PROJECT TITLE:
EVALUATION OF POTENTIAL AIR POLLUTION DAMAGE TO CONIFEROUS FOREST ECOSYSTEMS IN THE ASHLAND DIVISION, CUSTER NATIONAL FOREST
PROJECT NUMBER:
612-920-01-929-7521
INVESTIGATORS:
C. C. GORDON
UNIV OF MONTANA, DEPT OF BOTANY
MISSOULA, MT
CLINTON E. CARLSON (USFS)
PROJECT SUPERVISOR:
CLINTON E. CARLSON
U.S. FOREST SERVICE, REGION I
FEDERAL BLDG.
MISSOULA, MT 59801
COOPERATOR:
MONTANA DEPT OF HEALTH & ENVIRONMENTAL SCIENCES
PRIMARY SPONSOR:
U.S. FOREST SERVICE, REGION I
SECONDARY SPONSORS:
U.S. FOREST SERVICE, SURFACE ENVIRONMENT AND MINING
145 GRAND AVE.
BILLINGS, MT 59102
PRIMARY FUNDING AMOUNT:
59,500
SECONDARY FUNDING AMOUNTS:
29,000
TIME FRAME:
06 01 75 TO 06 30 76
LOCATION:
MT - ASHLAND DIV., CUSTER NAT. FOREST
ABSTRACT:

A SYSTEM OF 25-30 PERMANENT PLOTS ARE BEING ESTABLISHED ON THE ASHLAND DIVISION, CUSTER NATIONAL FOREST, TO DETECT AND MEASURE THE IMPACT OF COAL-FIRED POWER PLANT EMISSIONS ON FOREST AND RANGE RESOURCES. BASELINE VARIABLES BEING MEASURED INCLUDE CURRENT STATUS OF INSECTS, DISEASES, AND ABIOTIC PATHOLOGIES, TOTAL SULFUR AND FLUORIDE CONTENT OF REPRESENTATIVE VEGETATION, AND MEASUREMENT OF BIOMASS OF PONDEROSA PINE FOLIAGE. IN ADDITION, TOTAL CHLOROPHYLL OF PINE FOLIAGE IS BEING MEASURED. ANAYLSES OF AIR FOR FLUORIDE AND SULFUR ARE BEING DONE, AND CHEMISTRY OF PRECIPITATION IS BEING CHARACTERIZED.

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00000181

PROJECT TITLE:

CONSTRUCTION WORKER PROFILE

PROJECT NUMBER:

10570042

PROJECT SUPERVISOR:

JAMES A CHALMERS AND JUDITH GLAZNER
MOUNTAIN WEST RESEARCH, INC.
280 COLUMBINE ST. SUITE 301
DENVER, CO 80206

PRIMARY SPONSOR:

OLD WEST REGIONAL COMMISSION
JEANNETTE STUDER
PRATT BLDG. 306A
BILLINGS, MT 59101

PRIMARY FUNDING AMOUNT:

74,974

TIME FRAME:

02 01 75 TO 11 30 75

STATUS:

COMPLETED 11 30 75
MT ND WY UT AZ CO

ABSTRACT:

THE CONSTRUCTION WORKER PROFILE WAS CONDUCTED FOR THE OLD WEST REGIONAL COMMISSION TO STUDY THE SOCIO-ECONOMIC CONSEQUENCES OF THE CONSTRUCTION OF LARGE ENERGY RELATED FACILITIES. THE EMPHASIS OF THE STUDY WAS ON THE COLLECTION OF PRIMARY DATA, AND THREE DISTINCT EFFORTS WERE REQUIRED.

A HOUSEHOLD SURVEY WAS CONDUCTED WHICH CONSISTED OF DOOR-TO-DOOR INTERVIEWS WITH 1432 HOUSEHOLDS IN NINE WESTERN COMMUNITIES WHICH HAVE BEEN AFFECTED, ARE BEING AFFECTED, OR WILL BE AFFECTED BY LARGE ENERGY-RELATED CONSTRUCTION PROJECTS. THE PURPOSE OF THE HOUSEHOLD SURVEY WAS TO DETERMINE HOUSEHOLD AND LABOR FORCE CHARACTERISTICS, COMMUTING PATTERNS, RESIDENTIAL PREFERENCES, SOCIAL INTEGRATION, HOUSEHOLD EXPENDITURES, SATISFACTION WITH COMMUNITY SERVICES, AND ATTITUDES OF RESIDENTS ABOUT BOTH THE PROJECTS AND THEIR COMMUNITY. RESPONDENTS TO THE HOUSEHOLD SURVEY INCLUDE RESIDENTS WHO LIVED IN THE COMMUNITY PRIOR TO THE CONSTRUCTION PROJECTS AND, IN THE CASE OF CURRENTLY AFFECTED COMMUNITIES, NEWCOMER CONSTRUCTION WORKERS AND OTHER NEWCOMERS. FOR THE POST-IMPACT COMMUNITIES, A SAMPLE OF ALL RESIDENTS WAS INTERVIEWED.

A PROJECT SURVEY WAS UNDERTAKEN WHICH CONSISTED OF DISTRIBUTING AND COLLECTING SHORT SELF-ADMINISTERED QUESTIONNAIRES TO CONSTRUCTION WORKERS AT 14 MAJOR CONSTRUCTION SITES IN EIGHT WESTERN STATES. A TOTAL OF 3168 RESPONSES WERE OBTAINED WHICH INDICATE WORKERS' CHARACTERISTICS WITH RESPECT TO HOUSEHOLD COMPOSITION, PLACE OF RESIDENCE, PREVIOUS RESIDENCE, AND OCCUPATION.

A COMMUNITY SURVEY, DURING WHICH THREE SOCIAL SCIENTISTS LIVED FOR A TIME IN THREE OF THE HOUSEHOLD SURVEY COMMUNITIES, AND CONDUCTED STRUCTURED, IN-DEPTH INTERVIEWS WITH HOUSEHOLDS AND LESS STRUCTURED INTERVIEWS WITH INSTITUTIONAL REPRESENTATIVES, WAS THE THIRD ACTIVITY OF THE STUDY. THE PURPOSE OF THIS PROCEDURE WAS TO DETERMINE SOME OF THE CONSTRUCTION PERIOD IMPACTS ON THE PERSONAL LIVES OF COMMUNITY RESIDENTS AND ON THE COMMUNITIES' INSTITUTIONS, AND ALSO TO OBSERVE BOTH INDIVIDUAL AND INSTITUTIONAL RESPONSE TO THOSE IMPACTS.

REPORTS AND PUBLICATIONS:

THE RESULTS OF THE STUDY ARE SUMMARIZED IN 10 DOCUMENTS.

I. CONSTRUCTION WORKER PROFILE: FINAL REPORT
PURPOSE: TO PROVIDE A DETAILED ACCOUNT OF THE PURPOSE, METHOD, AND RESULTS OF THE STUDY. EMPHASIS IS PLACED ON GENERALIZATIONS SUPPORTED BY THE DATA WITH SPECIAL ATTENTION TO THE APPLICABILITY OF THE RESULTS TO THE PLANNING AND IMPACT ASSESSMENT PROCESSES.

II. CONSTRUCTION WORKER PROFILE: SUMMARY REPORT
PURPOSE: TO MAKE THE OBJECTIVES AND PRINCIPAL FINDINGS OF THE STUDY EASILY ACCESSIBLE TO THE NONTECHNICAL READER.

III. CONSTRUCTION WORKER PROFILE: COMMUNITY REPORTS
A. GREEN RIVER AND ROCK SPRINGS, WYOMING B. FORSYTH AND COLSTRIP, MONTANA C. CENTER, NORTH DAKOTA D. LANGDON, NORTH DAKOTA E. CONRAD, MONTANA F. KILLDEER, NORTH DAKOTA G. ST. GEORGE, UTAH. PURPOSE: TO PREPARE SEVEN DISTINCT COMMUNITY REPORTS CONTAINING DESCRIPTIONS OF THE HOUSEHOLD SURVEY FINDINGS FOR INDIVIDUAL COMMUNITIES AND SUMMARIES OF INFORMATION FROM THE PROJECT SURVEY ON PROJECTS RELEVANT TO EACH. DUE TO THE PROXIMITY OF ROCK SPRINGS TO GREEN RIVER AND OF FORSYTH TO COLSTRIP, THE COMMUNITY REPORTS FOR EACH OF THESE PAIRS OF COMMUNITIES WERE COMBINED IN SINGLE VOLUMES UNDER THE ASSUMPTION THAT ANYONE INTERESTED IN ONE WOULD BE INTERESTED IN THE OTHER.

IV. CONSTRUCTION WORKER PROFILE: USER'S GUIDE TO THE DATA. PURPOSE: TO DOCUMENT THE METHODOLOGY, PROCEDURES, AND RESULTS OF THE STUDY SO THAT THE BASIC DATA CAN BE USED BY OTHER RESEARCHERS. THE ENTIRE DATA SET IS DESCRIBED IN DETAIL AS ARE THE PROCEDURES FOR OBTAINING THE DATA ON TAPE, PUNCHED CARDS, OR HARD COPY.

AVAILABLE ON REQUEST FROM: OLD WEST REGIONAL COMMISSION, 1730 'K' ST., NW, SUITE 426, WASHINGTON, DC 20006.

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00000213

PROJECT TITLE:

SO2 REMOVAL USING ASH-ALKALI WET SCRUBBING

PROJECT SUPERVISOR:

E. A. SONDREAL; P. H. TUFTE
U.S. ERDA, GRAND FORKS ENERGY RESEARCH CENTER
GRAND FORKS, ND 58202

PRIMARY SPONSOR:

U.S. ERDA
U.S. EPA (FY76)

PRIMARY FUNDING AMOUNT:

1973 - 263,000 ; 1974 - 379,000 ; 1975 - 550,000 ;
1976 - 250,000

TIME FRAME:

07 01 70 TO 06 30 78

LOCATION:

ND

ABSTRACT:

DEVELOPMENT OF A WET SCRUBBING PROCESS FOR REMOVING SO2 FROM STACK GASES USING ALKALI AVAILABLE IN COAL ASH AS THE SORBENT. DEMONSTRATION OF THE FEASIBILITY, IN TERMS OF HIGH SO2 REMOVAL EFFICIENCY AND MINIMAL SCALING PROBLEMS, OF USING ASH-ALKALI SCRUBBING TO MEET FEDERAL SO2 EMISSION REGULATIONS ON A NEW CYCLONE-FIRED UNIT BURNING NORTH DAKOTA LIGNITE. MEASUREMENT OF SO2 ADSORPTION AND DESORPTION PROPERTIES OF WESTERN COAL CHAR, WESTERN FLY ASH AND NAHCOLITE (NAHCO 3)--A MINERAL ASSOCIATED WITH OIL SHALE--TO DETERMINE WHETHER THESE MATERIALS CAN BE USED IN EXISTING DRY PROCESSES FOR FLUE GAS DESULFERIZATION, OR FOR NOX ADSORPTION.

REPORTS AND PUBLICATIONS:

1. H. GRONHOVD, P. H. TUFTE, ET AL. SOME STUDIES ON STACK EMISSIONS FROM LIGNITE-FIRED POWERPLANTS. PREPRINT, MAY, 1973, 12 PP. 2. S. J. SELLE AND G. H. GRONHOVD. SOME COMPARISONS OF SIMULTANEOUS STACK GAS PARTICULATE DETERMINATIONS USING THE ASME & EPA METHODS. PRESENTED AT THE WINTER ANNUAL MEETING OF THE AMERICAN SOC. OF MECH. ENGR., NOV. 26-30, 1972, PREPRINT NO. 72-WA/APC-4, 5P. 3. E. A. SONDREAL AND P. H. TUFTE. COMPARISON OF FLUE GAS DESULFERIZATION FOR EASTERN VERSUS WESTERN U.S. COALS. PRESENTED AT THE 1974 FALL MEETING OF THE SOCIETY OF MINING ENGINEERS, AIME, SEPT. 1974, PREPRINT AVAILABLE. 4. E. A. SONDREAL, P. H. TUFTE, ET AL. WET SCRUBBING OF SO2 WITH POLLUTION CONTROL. PREPRINT AVAILABLE. 5. P. H. TUFTE, E. A. SONDREAL, ET AL. PILOT PLANT SCRUBBER TESTS TO REMOVE SO2 USING THE SOLUBLE ALKALI IN WESTERN COAL FLY ASH. PREPRINT, MAY 1973, 27 P. 6. R. C. ELLMAN, L. E. PAULSON AND S. A. COOLEY. ´COMMERCIAL-SCALE DRYING OF LOW-RANK WESTERN COALS, PART I-RAIL SHIPMENT TEST OBSERVATIONS´. PRESENTED AT 1975 LIGNITE SYMPOSIUM, MAY 1975, 21 PP.

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00000272
PROJECT TITLE:
ENERGY REDUCTION THROUGH IMPROVED IRRIGATION PRACTICES
PROJECT NUMBER:
10570001
INVESTIGATORS:
W. E. SPLINTER; J. R. GILLEY
UNIV. OF NEBRASKA, DEPT. OF AGRICULTURAL ENGINEERING
LINCOLN, NE 68583
PROJECT SUPERVISOR:
M. W. HALL
UNIV. OF NEBRASKA, WATER RESOURCES RESEARCH INSTITUTE
LINCOLN NE 68583
COORDINATOR:
UNIV. OF NEBRASKA, AG. EXP. STATION
HOWARD W. OTTOSON
LINCOLN, NE 68583
PRIMARY SPONSOR:
OLD WEST REGIONAL COMMISSION
WILLIAM J. FOGARTY
FRATT BLDG, SUITE 306A
BILLINGS, MT 59101
PRIMARY FUNDING AMOUNT:
121,000
TIME FRAME:
08 01 74 TO 07 31 76
LOCATION:
NE
ABSTRACT:

TWO OF THE MAJOR PROBLEMS FACING THE WORLD TODAY ARE INCREASING DEMANDS FOR FOOD AND DECREASING SUPPLIES OF FUEL ENERGY FOR PRODUCTION. ONE VERY EFFECTIVE WAY TO INCREASE FOOD PRODUCTION IS THROUGH IRRIGATION, ESPECIALLY IN THE WESTERN UNITED STATES. YET IRRIGATION REQUIRES A HIGH ENERGY COST, EITHER THROUGH CONSTRUCTION OF DAMS, CANALS AND LATERALS OR DEVELOPMENT OF WELLS AND THE USE OF PUMPS.

MORE SPECIFICALLY, THE AVERAGE SURFACE IRRIGATION SYSTEM IN NEBRASKA REQUIRES 30.9 GALLONS OF DIESEL FUEL PER ACRE PER YEAR OR ITS EQUIVALENT IN ELECTRICITY, NATURAL GAS OR PROPANE. THIS IS ON THE BASIS OF A LIFT OF 120 FEET, PUMPING AT A RATE OF 900 GPM AND APPLYING 20 ACRE INCHES OF WATER WITH A PUMPING PLANT OPERATING AT 80 PERCENT EFFICIENCY. OVER 2.7 MILLION ACRES OF LAND IN NEBRASKA ARE SURFACE IRRIGATED FROM PUMPS. THE AVERAGE SPRINKLER IRRIGATION SYSTEM REQUIRES 53.4 GALLONS OF DIESEL FUEL PER ACRE PER YEAR OR ITS EQUIVALENT. THIS IS BASED ON AN AVERAGE LIFT OF 273 FEET, PUMPING 900 GPM OF 80 PERCENT EFFICIENCY AND APPLYING 15 ACRE INCHES PER YEAR. OVER 1.4 MILLION ACRES ARE IRRIGATED BY SPRINKLER METHODS IN NEBRASKA.

THE OBJECTIVE OF THIS PROJECT IS TO REDUCE BY 50 PERCENT, THE ENERGY REQUIRED FOR IRRIGATION BY SPRINKLER AND SURFACE SYSTEMS. THIS WILL BE ACCOMPLISHED PRIMARILY THROUGH REFINEMENTS OF IRRIGATION SCHEDULING PROCEDURES FOR CENTER PIVOT IRRIGATION SYSTEMS ACCORDING TO PLANT DEMANDS AND WEATHER PATTERNS AND THROUGH DEVELOPMENT OF AUTOMATED GATED PIPE SYSTEMS THAT ARE PRACTICAL AND ECONOMICAL FOR ON-FARM USE. SPECIFIC TASKS ARE: 1. DEVELOP REFINEMENTS IN SCHEDULING PROCEDURE FOR CENTER-PIVOT IRRIGATION SYSTEMS SO THAT TYPE OF SOIL, STAGE OF PLANT GROWTH AND PREDICTED WEATHER PATTERNS ARE TAKEN INTO CONSIDERATION. 2. DETERMINE MOISTURE RELEASE CURVES AND WATER POTENTIAL RELATIONSHIPS FOR SOIL INVOLVING MAJOR IRRIGATION ACTIVITY. DEVELOP AND TEST COMPUTER MODELS OF CORN GROWTH 3. ESTABLISH TEST PLOTS, MONITOR SOIL MOISTURE AND PLANT GROWTH, AND MEASURE WEATHER DATA TO COMPARE RESULTS WITH COMPUTER PREDICTIONS OF EVAPOTRANSPIRATION AND THE CORN GROWTH MODEL. 4. DEVELOP IMPROVED COMPONENTS OF THE AUTOMATED GATED PIPE SYSTEM. 5. USING THE GROWTH MODEL, COMPARE REAL-TIME SCHEDULING TO PROBABILISTIC SCHEDULING AND NORMAL IRRIGATION PROCEDURES.

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00000300
PROJECT TITLE:
TECHNOLOGY ASSESSMENT OF WESTERN ENERGY RESOURCE DEVELOPMENT
PROJECT NUMBER:
WA75X-128
INVESTIGATORS:
F. SCOTT LAGRONE
RADIAN CORPORATION
8500 SHOAL CREEK BLVD
AUSTIN, TX 78766
MICHAEL A. CHARTOCK; R. LEON LEONARD (S&PP)
PROJECT SUPERVISOR:
IRVIN L. (JACK) WHITE
UNIV OF OKLAHOMA, SCIENCE & PUBLIC POLICY PROG.
601 ELM, ROOM 432
NORMAN, OK 73069
PRIMARY SPONSOR:
U.S. EPA
STEVE PLOTKIN
OFFICE OF ENERGY, RD-6-92
401 M ST. SW
WASHINGTON, DC 20460
PRIMARY FUNDING AMOUNT:
TOTAL 1,300,000
FY 76 - 500,000 ; FY 77 - 480,000 ; FY 78 - 320,000
TIME FRAME:
07 01 75 TO 07 01 78
LOCATION:
AZ CA CO ID MT NV NM ND OR SD WA WY UT
ABSTRACT:

THE SCIENCE AND PUBLIC POLICY PROGRAM (S&PP) OF THE UNIVERSITY OF OKLAHOMA AND THE RADIAN CORPORATION OF AUSTIN, TEXAS, ARE CONDUCTING AN INTEGRATED TECHNOLOGY ASSESSMENT (ITA) OF COAL, OIL, NATURAL GAS, OIL SHALE, URANIUM, AND GEOTHERMAL RESOURCE DEVELOPMENT IN THE WESTERN UNITED STATES. UNDER A JOINT PROGRAM DIRECTORATE, S&PP'S AND RADIAN'S INTERDISCIPLINARY CORE RESEARCH TEAMS WILL EMPLOY A CONCEPTUAL APPROACH TO TECHNOLOGY ASSESSMENT DEVELOPED BY S&PP. THE PURPOSE OF THIS ITA IS TO DEFINE, EXPLORE, AND EVALUATE THE FULL RANGE OF SOCIAL, ECONOMIC, ENVIRONMENTAL, INSTITUTIONAL, AND OTHER CONSEQUENCES LIKELY TO RESULT FROM THE DEVELOPMENT OF THE SIX DESIGNATED WESTERN ENERGY RESOURCES. THE APPROACH WILL TAKE INTO ACCOUNT BOTH QUANTITATIVE AND QUALITATIVE COSTS, BENEFITS, RISKS, AND OPPORTUNITIES. THREE TIME PERIODS WILL BE CONSIDERED IN THE ASSESSMENT: FROM THE PRESENT TO 1980; TO 1990; AND TO 2000. A NUMBER OF REPORTS WILL BE PREPARED DURING THE STUDY, INCLUDING A FIRST-YEAR REPORT, FIRST-GENERATION ITA REPORT, AND REAL-TIME REFINEMENTS IN THE SECOND AND THIRD YEAR.

ENERGY RESEARCH INFORMATION SYSTEM

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00000301
PROJECT TITLE:
U.S.G.S. COAL EXPLORATION
PROJECT SUPERVISOR:
ROBERT E. MATSON
MONTANA BUREAU OF MINES AND GEOLOGY
BUTTE, MT.
COOPERATOR:
MOHL DRILLING
BEULAH, ND
PRIMARY SPONSOR:
U.S. GEOLOGICAL SURVEY, CONSERVATION DIV.
PRIMARY FUNDING AMOUNT:
100,000
TIME FRAME:
05 01 75 TO 11 15 75
LOCATION:
MT WY
ABSTRACT:
A TOTAL OF 124 COAL TEST HOLES WERE DRILLED IN CAMPBELL AND SHERIDAN COUNTIES, WYOMING, AND IN BIG HORN, RICHLAND AND DAWSON COUNTIES, MONTANA. A NUMBER OF CORES WERE TAKEN OF VARIOUS COAL BEDS AND A NUMBER OF WATER TEST WELLS WERE ALSO INSTALLED IN A NUMBER OF LOCATIONS IN MONTANA.
THE EVALUATION OF THE DRILLING DATA IS IN PREPARATION.

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00000302
PROJECT TITLE:
U.S.G.S. MINE SAMPLING PROJECT
PROJECT SUPERVISOR:
ROBERT E. MATSON
MONTANA BUREAU OF MINES AND GEOLOGY
BUTTE, MT 59701
PRIMARY SPONSOR:
U.S. GEOLOGICAL SURVEY, CONSERVATION DIV.
PRIMARY FUNDING AMOUNT:
10,000
TIME FRAME:
10 01 75 TO 11 15 76
LOCATION:
MT WY
ABSTRACT:
CHANNEL SAMPLES FOR TRACE-ELEMENT STUDIES WILL BE COLLECTED FROM OPERATING MINES IN MONTANA AND WYOMING.

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00000303
PROJECT TITLE:
UNDERGRADUATE RESEARCH PARTICIPATION
PROJECT SUPERVISOR:
HUGO V. SCHMIDT
MONTANA STATE UNIV., DEPT. OF PHYSICS
BOZEMAN, MT 59715
PRIMARY SPONSOR:
NATIONAL SCIENCE FOUNDATION
PRIMARY FUNDING AMOUNT:
22,320
TIME FRAME:
06 01 75 TO 09 30 75
LOCATION:
MT
ABSTRACT:
16 UNDERGRADUATES, 3 FROM SCHOOLS OTHER THAN MSU, ARE BEING DIRECTED IN ENERGY-RELATED RESEARCH BY THE FOLLOWING PERSONS LISTED BELOW. EACH STUDENT IS WORKING FULL-TIME FOR 10 TO 12 WEEKS.
THE FOLLOWING PROJECTS ARE BEING CONDUCTED TO INVOLVE UNDERGRADUATES FROM MSU AND NEIGHBORING SCHOOLS IN ENERGY-RELATED RESEARCH THIS SUMMER:
1. DOMESTIC WATER HEATED FROM FURNACE COMBUSTION GASES, PROF. DOUGLAS POLETTE, AGRICULTURAL AND INDUSTRIAL EDUCATION, 1 STUDENT.
2. ENERGY CONSERVATION AND BUILDING PERFORMANCE, PROF. WILLIAM SEMPLE, ARCHITECTURE, 4 STUDENTS.
3. ANALYTICAL PROCEDURES APPLIED TO ENERGY SOURCES AND THEIR POLLUTANTS, PROF. RAY WOODRIFF, CHEMISTRY, 3 STUDENTS.
4. GEOLOGICAL AND GEOCHEMICAL STUDIES OF HOT SPRINGS, PROF. ROBERT CHADWICK, EARTH SCIENCES, 1 STUDENT.
5. PHOTOEMISSION STUDIES OF SURFACES, PROF. GERALD LAPEYRE AND DR. JAMES ANDERSON, PHYSICS, 1 STUDENT.
6. MATERIALS STUDIES USING VAN DE GRAAFF ACCELERATOR, PROF. WENDLAND BEEZHOLD, PHYSICS, 1 STUDENT.
7. ENERGY TRANSFER IN SOLID STATE LASER MATERIALS, PROF. RUFUS CONE, PHYSICS, 2 STUDENTS.
8. WIND ENERGY SUPPLEMENTATION OF RESIDENTIAL POWER, PROF. HUGO SCHMIDT, PHYSICS, 1 STUDENT.
9. FIELDWORK PROJECTS IN SOCIOLOGY, PROF. PATRICK C. JOBES, SOCIOLOGY, 2 STUDENTS.

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00000304
PROJECT TITLE:
STRIPPABLE COAL DEPOSITS IN THE HANNA COAL FIELD, WYOMING

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PROJECT NUMBER:
   G0254015
INVESTIGATORS:
   GLASS, GARY B.
PROJECT SUPERVISOR:
   DOSS M. WHITE, JR.
   U.S. BUREAU OF MINES, IFOC
   DENVER FEDERAL CENTER
   DENVER, CO
PRIMARY SPONSOR:
   U.S. BUREAU OF MINES, IFOC
   DENVER FEDERAL CENTER
   DENVER, CO
PRIMARY FUNDING AMOUNT:
   15,000
TIME FRAME:
   02 03 75 TO 02 02 77
LOCATION:
   WY - CARBON COUNTY, HANNA COAL FIELD
ABSTRACT:
   OPEN FILE, PUBLISHED, AND COMPANY DATA WILL BE COMBINED
   WITH AERIAL PHOTOGRAPHY AND RECONNAISSANCE FIELD MAPPING
   TO CONSTRUCT COAL OUTCROP MAPS, STRUCTURE CONTOUR MAPS,
   AND OVERBURDEN MAPS FOR VARIOUS COALS IN THE HANNA COAL
   FIELD.  STRIPPABLE COAL RESOURCES WILL THEN BE ESTIMATED
   FROM THESE MAPS.

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00000305
PROJECT TITLE:
   CORE DRILLING IN THE HANNA COAL FIELD
PROJECT NUMBER:
   14-08-00001-6-193
INVESTIGATORS:
    GARY B. GLASS
PROJECT SUPERVISOR:
   ELMER M. SCHELL
   U.S. GEOLOGICAL SURVEY, CONSERVATION DIV.
   P.O. BOX 2373
   CASPER, WY  82601
COORDINATOR:
   U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.
   SAM WEST
   215 EAST 8TH AVENUE, P.O. BOX 2087
   CHEYENNE, WY  82001
PRIMARY SPONSOR:
   U.S. GEOLOGICAL SURVEY CONSERVATION DIV.
   ELMER M. SCHELL
   P.O. BOX 2373
   CASPER, WY  82601
SECONDARY SPONSORS:
   U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.
   SAM WEST
   215 EAST 8TH AVENUE, P.O. BOX 2087
   CHEYENNE, WY  82001
PRIMARY FUNDING AMOUNT:
   60,000
SECONDARY FUNDING AMOUNT:
   2,000
TIME FRAME:
   05 01 75 TO 04 30 77
LOCATION:
   WY - CARBON COUNTY, HANNA COAL FIELD
ABSTRACT:
   THIS DRILLING PROJECT IS DESIGNED TO PENETRATE AS MUCH
   OF THE COAL-BEARING PORTIONS OF THE HANNA AND FERRIS
   FORMATIONS AS POSSIBLE WITHIN FUNDING LIMITATIONS.  THREE
   TO FIVE 500-1,000 FOOT LONG CORES ARE PROPOSED.  THE SITES
   FOR THESE CORE HOLES WILL BE CHOSEN TO ATTAIN MAXIMUM
   BENEFIT FROM BOTH A GEOLOGIC AND MINING STANDPOINT.
   MOST SPECIFICALLY, THESE LONGER CORE HOLES WILL SERVE AS
   INVALUABLE AIDS TO THE ACCURATE CORRELATION OF COAL BEDS
   WITHIN THE HANNA COAL FIELD.
   THE PROJECT WILL INCLUDE DETAILED DESCRIPTIONS OF THE
   CORE AS WELL AS MECHANICAL LOGGING.  ADDITIONALLY, SPLITS
   OF EACH CORE WILL BE SENT TO THE U.S. BUREAU OF MINES
   AND THE U.S. GEOLOGICAL SURVEY FOR COAL AND ROCK ANALYSIS,
   RESPECTIVELY.
   ALL OR SOME OF THE CORE HOLES WILL BE COMPLETED AS MONITOR
   WATER WELLS AND TURNED OVER TO THE WATER RESOURCES DIVISION
   OF THE U.S. GEOLOGICAL SURVEY AFTER COMPLETION.

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00000306
PROJECT TITLE:
   WYOMING COAL CHARACTERISTICS
PROJECT NUMBER:
   G0244004
INVESTIGATORS:
   GARY B. GLASS
PROJECT SUPERVISOR:
   DOSS M. WHITE, JR.
   U.S. BUREAU OF MINES, IFOC
   DENVER FEDERAL CENTER
   DENVER, CO
COOPERATOR:
   U.S. GEOLOGICAL SURVEY
   VERNON SWANSON
   BRANCH OF COAL RESOURCES
   DENVER FEDERAL CENTER
   DENVER, CO
PRIMARY SPONSOR:
   U.S. BUREAU OF MINES, IFOC
```

1.1 GENERAL

DOSS M. WHITE, JR.
DENVER FEDERAL CENTER, BUILDING 20
DENVER, CO

SECONDARY SPONSORS:
WYOMING DEPT. OF ECONOMIC PLANNING & DEVELOPMENT
JOHN GOODIER, CHIEF, MINERALS DIV.
720 WEST 18TH STREET
CHEYENNE, WY 82001

PRIMARY FUNDING AMOUNT:
24,780

SECONDARY FUNDING AMOUNT:
2,500

TIME FRAME:
07 01 74 TO 11 31 75

STATUS:
COMPLETED 11 31 75

LOCATION:
WY - CARBON, CAMPBELL, CONVERSE, LINCOLN, SHERIDAN, SWEETWATER COUNTIES

ABSTRACT:
IN THE SUMMER AND FALL OF 1974, THE WYOMING GEOLOGICAL SURVEY COLLECTED 54 FACE-CHANNEL COAL SAMPLES FROM ACTIVE MINES OR OUTCROPS IN FOUR OF THE 10 MAJOR COAL-BEARING AREAS OF WYOMING. THESE SAMPLES WERE SPLIT IN THE FIELD TO THE U.S. GEOLOGICAL SURVEY, AND TO THE JOINT DEPARTMENT OF GEOLOGY/WYOMING GEOLOGICAL SURVEY LABORATORIES FOR ANALYSIS. ULTIMATE AND PROXIMATE ANALYSES, ASH FUSION TEMPERATURES, HARDGROVE GRINDABILITY INDICES, REAL SPECIFIC GRAVITIES, FREE-SWELLING INDICES, FORMS OF SULFUR, ASH COMPOSITION, AND CONCENTRATIONS OF UP TO 32 TRACE ELEMENTS WERE DETERMINED ON EACH SAMPLE BY VARIOUS OF THE THE LABORATORIES. TO COMPLIMENT EACH OF THE ANALYSES, A DETAILED MEASURED SECTION WAS MADE AT EACH SAMPLING SITE. SAMPLING PROCEDURES ARE ALSO DESCRIBED.

REPORTS AND PUBLICATIONS:
GARY GLASS. 'REPORT OF INVESTIGATIONS NO. 11: ANALYSES AND MEASURED SECTIONS OF 54 WYOMING COAL SAMPLES, COLLECTED IN 1974.'
WYOMING GEOLOGICAL SURVEY, BOX 3008, UNIV. STATION, LARAMIE, WY 82071. PRICE NOT YET DETERMINED.

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00000307
PROJECT TITLE:
EVALUATE OVERBURDEN AND RECLAMATION PRACTICES - SURFACE COAL MINES
PROJECT NUMBER:
S0144091
PROJECT SUPERVISOR:
FRANK COOK
MATHEMATICA, INC.
P.O. BOX 2392
PRINCETON, NJ
PRIMARY SPONSOR:
U.S. BUREAU OF MINES, SPOKANE MINING RESEARCH CENTER
LOUIS M. MCNAY
EAST 315 MONTGOMERY AVE
SPOKANE, WA 99207
PRIMARY FUNDING AMOUNT:
1974 - 477,029 ; 1975 - 73,000
TIME FRAME:
06 29 74 TO 12 29 75
ABSTRACT:
A COMPREHENSIVE NATIONAL SURVEY WILL EVALUATE CURRENT OVERBURDEN HANDLING TECHNIQUES AND LAND-RECLAMATION PRACTICES AT SURFACE COAL-MINE OPERATIONS. THE DATA WILL FORM A BASELINE FOR IDENTIFICATION, DEVELOPMENT, AND EVALUATION OF INNOVATIVE OR IMPROVED MINING AND RECLAMATION PRACTICES AND FOR DISSEMINATING INFORMATION ON CURRENT AND PROPOSED PRACTICES TO GOVERNMENT AND INDUSTRY. DATA WILL BE GATHERED FROM INTERVIEWS WITH MINING RESEARCH AND REGULATORY AGENCIES AND FROM IN-DEPTH FIELD SURVEYS AT ABOUT 160 ACTIVE MINING OPERATIONS.
TYPE OF STUDY:
PART OF ´SURFACE MINING, EXTRACTION, RECLAMATION SUBPROGRAM´, U.S. BUREAU OF MINES.

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00000308
PROJECT TITLE:
EFFECTS OF SURFACE CONFIGURATION IN WATER POLLUTION CONTROL ON SEMI-ARID MINED LANDS
INVESTIGATORS:
WAYNE VAN VOAST
MONTANA BUREAU OF MINES AND GEOLOGY
I. B. JENSEN
MONTANA STATE UNIV.
BOZEMAN, MT
PROJECT SUPERVISOR:
R. L. HODDER
MONTANA STATE UNIV.
BOZEMAN, MT
COOPERATOR:
WESTERN ENERGY CO., COLSTRIP, MT
KNIFE RIVER COAL CO., SAVAGE, MT
NORTH AMERICAN COAL CO., BEULAH, ND
ARCHES MINERAL, HANNA, WY
PACIFIC POWER & LIGHT, GLENROCK, WY
PRIMARY SPONSOR:
U.S. EPA
PRIMARY FUNDING AMOUNT:
1,389,211
TIME FRAME:
05 01 74 TO 05 01 78
LOCATION:
MT ND
ABSTRACT:
1. OBJECTIVES OF THIS STUDY ARE TO DEMONSTRATE THE EFFECTIVENESS OF SEVERAL SURFACE CONFIGURATIONS IN: CONTROLLING EROSION, RUN-OFF, SEDIMENTATION AND POLLUTION OF ADJACENT DRAINAGES; QUICKLY PRODUCING A DESIRABLE STABILIZING VEGETATIVE COVER; CREATING AN EQUILIBRIUM BETWEEN PRECIPITATION ABSORBED AND SOIL MOISTURE EVAPORATED AND TRANSPIRED SO THAT GROUND WATER POLLUTION WILL REMAIN MINIMAL; PRODUCING AN OVERALL DESIRABLE RECLAMATION DESIGN PROVIDING EFFECTIVE DRAINAGE, ESTHETICS PRODUCTIVENESS AND USE.
2. SURFACE MINED STUDY AREAS RANGING IN SIZE FROM FORTY TO SIXTY ACRES WERE SELECTED NEAR COLSTRIP, MONTANA; SAVAGE, MONTANA; AND BEULAH, NORTH DAKOTA.
3. INTENSIVE METEOROLOGICAL SURFACE RUNOFF AND WATER AQUIFER LEVEL MONITORING WILL BE ACCOMPLISHED WITH AUTOMATIC DATA LOGGING SYSTEMS. FIVE 0.21 HECTARE MICRO-WATERSHEDS HAVE BEEN CONSTRUCTED AT EACH AREA TO INTENSIVELY EVALUATE EACH OF THE FIVE SURFACE MANIPULATION TREATMENTS: CHISELING ON RAW SPOILS, GOUGING ON RAW SPOILS, CHISELING ON TOPSOIL, GOUGING ON TOPSOIL, AND DOZER BASINS ON TOPSOIL. TREATMENTS WILL BE INITIATED DURING LATE MARCH AND APRIL.
REPORTS AND PUBLICATIONS:
ANNUAL PROGRESS REPORT MAY, 1975.

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00000309
PROJECT TITLE:
SOIL MICROBIOLOGICAL STUDIES ON THE RECLAMATION OF COAL SURFACE MINE SPOILS IN EASTERN MONTANA.
INVESTIGATORS:
KENNETH TEMPLE, MICROBIOLOGY
MONTANA STATE UNIV.
BOZEMAN, MT

LARRY HERSMANN, MICROBIOLOGY
MONTANA STATE UNIV.
BOZEMAN, MT
R. L. HODDER
MONTANA STATE UNIV.
BOZEMAN, MT
PROJECT SUPERVISOR:
EDWARD J. DEPUIT
MONTANA STATE UNIV.
AG. EXP. STATION, DEPT. OF ANIMAL & RANGE SCIENCES
BOZEMAN, MT
COOPERATOR:
DEPT. MICROBIOLOGY, MONTANA STATE UNIV., BOZEMAN, MT
WESTERN ENERGY CO., BUTTE, MT
PRIMARY SPONSOR:
CHEVRON OIL CO.
OLIN SMITH
DENVER, CO
PRIMARY FUNDING AMOUNT:
10,000
TIME FRAME:
07 01 75 TO 06 30 76
STATUS:
COMPLETED 06 30 76
LOCATION:
MT
ABSTRACT:

SOIL DEVELOPMENT ON THE SPOILS SURFACE IS NOW RECOGNIZED AS A PRIME FACTOR DETERMINING THE STATUS OF RECLAMATION OF COAL SURFACE MINED LANDS, AND SOIL MICROBIOLOGICAL PROCESSES ARE OF CRITICAL IMPORTANCE TO THIS DEVELOPMENT. THE INITIAL PHASE OF THIS PROJECT WAS CONCERNED WITH DETERMINATION OF FEASIBLE, MEANINGFUL METHODS AND PROCEDURES FOR MONITORING MICROBIOLOGICAL PROCESSES ON SPOILS, AND SOME INITIAL FIELD MEASUREMENTS WERE CONDUCTED. THE CURRENT PHASE OF THIS PROJECT INVOLVES FURTHER FIELD MEASUREMENTS OF SELECTED MICROBIOLOGICAL PARAMETERS (E.G. SPECIFIC ENZYME CONCENTRATIONS, ATP LEVELS) ON NATIVE SOILS AND SPOILS IN VARYING STAGES OF RECLAMATION TO DETERMINE THE PRESENT STATUS OF SOIL MICROBIOLOGICAL DEVELOPMENT AND ALSO TO HOPEFULLY DEFINE CAUSE-EFFECT RELATIONSHIPS. ULTIMATELY, THE GOAL OF THIS RESEARCH IS TO SUGGEST AND TEST PRACTICAL SOLUTIONS TO SOIL MICROBIOLOGICAL PROBLEMS ASSOCIATED WITH SURFACE MINED LAND RECLAMATION.

REPORTS AND PUBLICATIONS:

STEWART, R. C. 'AN INVESTIGATION OF MICROBIOLOGICAL PARAMETERS IN THE REVEGETATION OF COAL MINE SPOILS,' M.S. THESIS, MONTANA STATE UNIVERSITY 161 P., AND MONTANA AG. EXP. STATION RESEARCH REPORT 1975.

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00000310
PROJECT TITLE:
BASELINE AND POSTMINING ENVIRONMENTAL CONSIDERATIONS ASSOCIATED WITH A COAL SURFACE MINING OPERATION IN SOUTHEASTERN MONTANA.
INVESTIGATORS:
RICHARD L. HODDER
MONTANA STATE UNIV., AG. EXP. STATION
BOZEMAN, MT
R. L. PHILLIPS
U.S. FISH AND WILDLIFE SERVICE
PROJECT SUPERVISOR:
EDWARD J. DEPUIT
MONTANA STATE UNIV.
AG. EXP. STATION, DEPT. OF ANIMAL & RANGE SCIENCES
BOZEMAN, MT
COOPERATOR:
U.S. FISH AND WILDLIFE SERVICE
UNIV. OF WISCONSIN, MADISON, WI
PRIMARY SPONSOR:
SHELL OIL CO.
L.A. DREW
HOUSTON, TX
PRIMARY FUNDING AMOUNT:
52,980
TIME FRAME:
07 01 74 TO 06 30 75
STATUS:
COMPLETED 06 30 75
LOCATION:
MT
ABSTRACT:

STUDIES TO DATE HAVE BEEN PRIMARILY CONCERNED WITH COLLECTION OF BASELINE BIOLOGICAL AND PHYSICAL DATA FROM AN EXTENSIVE POTENTIAL COAL SURFACE MINING AREA IN SOUTHEASTERN MONTANA, INCLUDING INFORMATION ON VEGETATION, WATERSHED CONDITION, WILDLIFE AND AIR QUALITY. AN INTENSIVE ANALYSIS OF OVERBURDEN (I.E. POTENTIAL SPOIL) MATERIAL HAS ALSO BEEN CONDUCTED. THESE DATA WILL BE USED IN FUTURE STUDIES TO DETERMINE AND TEST RECLAMATION PRIORITIES AND PROCEDURES, AND ALSO TO MONITOR THE IMPACT OF MINING, SHOULD IT OCCUR, ON THE ENVIRONMENT OF THE SURROUNDING AREA. MOST SIGNIFICANT OF THESE LATTER STUDIES INCLUDE AN EVALUATION OF THE EFFECT OF MINING ACTIVITY ON AREA WILDLIFE POPULATIONS (CONDUCTED IN COOPERATION WITH THE U.S. FISH AND WILDLIFE SERVICE) AND A STUDY OF THE IMPACT OF A COAL MINE RAILROAD SPUR LINE ON THE SURROUNDING ENVIRONMENT.

REPORTS AND PUBLICATIONS:

NUMEROUS PROGRESS REPORTS TO SHELL OIL COMPANY, IN VARIOUS

STAGES OF PREPARATION FOR PUBLICATION AS MONTANA AG. EXP. STATION RESEARCH REPORTS

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00000311

PROJECT TITLE:
RESEARCH ON RECLAMATION OF SURFACE MINED LANDS AT COLSTRIP, MONTANA.

INVESTIGATORS:
RICHARD L. MEYN

PROJECT SUPERVISOR:
RICHARD L. HODDER
MONTANA STATE UNIV., DEPT. OF ANIMAL & RANGE SCIENCES
BOZEMAN, MT 59715

PRIMARY SPONSOR:
WESTERN ENERGY CO.
COLSTRIP, MT

PRIMARY FUNDING AMOUNT:
177,529

TIME FRAME:
04 01 65 TO 12 31 75

LOCATION:
MT

ABSTRACT:
CONDUCT RESEARCH AND FIND SOLUTIONS TO PROBLEMS CONCERNING RECLAMATION OF STRIP MINED LANDS AT COLSTRIP, MONTANA, INCLUDING:
1. PROBLEMS OF REVEGETATION AND USE.
2. PROBLEMS OF SOIL STABILITY.
3. ENHANCEMENT OF SOIL DEVELOPMENT AND FERTILITY.

REPORTS AND PUBLICATIONS:
MONTANA AGRICULTURAL EXPERIMENT STATION REPORTS NO. 8, 20, 40, 69

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00000312

PROJECT TITLE:
ENERGY RELATED GRADUATE TRAINEESHIP PROGRAM

PROJECT SUPERVISOR:
HENRY PARSONS, ASST.
MONTANA STATE UNIV., COLLEGE OF GRADUATE STUDIES
BOZEMAN, MT

PRIMARY SPONSOR:
NATIONAL SCIENCE FOUNDATION

PRIMARY FUNDING AMOUNT:
54,000

TIME FRAME:
09 01 74 TO 08 31 77

LOCATION:
MT

ABSTRACT:
THE OBJECTIVES OF PRESENT STUDIES ARE TO REDUCE UNDESIRABLE EFFECTS OF COAL SURFACE MINING AND RESTORE OR CREATE A DESIRABLE AND PRODUCTIVE ENVIRONMENT IN THE SHORTEST PRACTICAL TIME. ASSOCIATED OBJECTIVES ARE DESIGNED TO:
1. DETERMINE METHODS AND CRITERIA FOR THE ESTABLISHMENT OF EFFECTIVE AND DESIRABLE PLANT COVER FOR PERMANENT PROTECTION OF MINED LANDS UNDER THE VARIED ENVIRONMENTAL CONDITIONS ENCOUNTERED.
2. STUDY, ANALYZE, AND DEFINE ECONOMICALLY FEASIBLE STANDARDS AND REQUIREMENTS FOR RECLAMATION PRACTICES ADOPTED TO THE MONTANA STRIP MINING AND RECLAMATION ACT OF 1973.
3. DEVELOP METHODS FOR MINIMIZING WATER, SOIL AND AIR POLLUTION.
4. PRESERVE, RESTORE, OR ENHANCE THE NATURAL BEAUTY OF AFFECTED LANDS.
5. DEVELOP AND PROMOTE COORDINATED MINING AND RECLAMATION TECHNIQUES.
6. DEVELOP AND EVALUATE SPECIFIC RECLAMATION PREPLANNING TECHNOLOGY AS A BASIS UPON WHICH TO DETERMINE THE FEASIBILITY OF MINING, MINING TECHNIQUES REQUIRED, RECLAMATION TECHNIQUES NECESSARY, AND TO FORM THE IRREFUTABLE BASIS UPON WHICH TO JUDGE RECLAMATION SUCCESS.

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00000313

PROJECT TITLE:
PLANT & SOILS RECLAMATION RESEARCH ON STRIP MINED LANDS

INVESTIGATORS:
DOUGLAS J. DOLLHOPF

PROJECT SUPERVISOR:
RICHARD L. HODDER
MONTANA STATE UNIV.
BOZEMAN, MT 59715

PRIMARY SPONSOR:
DECKER COAL CO.
DECKER, MT

PRIMARY FUNDING AMOUNT:
23,000

TIME FRAME:
07 01 75 TO 06 30 76

LOCATION:
MT

ABSTRACT:
EMPLOYING NEUTRON PROBE TECHNIQUES, THE SOIL WATER FLOW CHARACTERISTICS IN SPOILS IS BEING MODELED. THE SAME IS BEING DONE ON ADJACENT NATIVE RANGE AREAS. SOLUTE MOVEMENT AT THESE SAME LOCATIONS IS BEING CORRELATED TO THE SOIL WATER FLOW. THE EFFECTS OF GYPSUM AND CALCIUM CHLORIDE ON RECLAMATION OF SALINE-ALKALI SPOILS IS BEING INVESTIGATED.

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00000314

PROJECT TITLE:
EFFECTS OF COAL STRIP MINING ON VEGETATION AND SOIL WATER RELATIONSHIP

INVESTIGATORS:
DOUGLAS J. DOLLHOPF

PROJECT SUPERVISOR:
RICHARD HODDER
MONTANA STATE UNIV.
BOZEMAN, MT 59715

PRIMARY SPONSOR:
PEABODY COAL CO.

PRIMARY FUNDING AMOUNT:
20,000

TIME FRAME:
07 01 75 TO 06 30 76

LOCATION:
MT

ABSTRACT:
EMPLOYING NEUTRON PROBE TECHNIQUES THE SOIL WATER FLOW CHARACTERISTICS IN SPOILS IS BEING MODELED. THE SAME IS BEING DONE ON ADJACENT NATIVE RANGE AREAS. SOLUTE MOVEMENT AT THESE SAME LOCATIONS IS BEING CORRELATED TO THE SOIL WATER FLOW.

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00000315

PROJECT TITLE:
LABORATORY LEACHING STUDIES OF COAL MINE SPOIL MATERIAL

PROJECT SUPERVISOR:
GORDON K. PAGENKOPF
MONTANA STATE UNIV., DEPT. OF CHEMISTRY
BOZEMAN, MT

COOPERATOR:
MONTANA BUREAU OF MINES AND GEOLOGY
OFFICE OF WATER RESEARCH & TECHNOLOGY
U.S. GEOLOGICAL SURVEY

PRIMARY SPONSOR:
U.S. EPA, REGION VIII
DENVER, CO 80201

PRIMARY FUNDING AMOUNT:
2,495

TIME FRAME:
03 01 74 TO 06 30 74

STATUS:
COMPLETED 06 30 74

LOCATION:
MT

ABSTRACT:
OBJECTIVES OF STUDY - TO PROVIDE QUANTITATIVE CHEMICAL AND PHYSICAL DATA REGARDING THE LEACHABILITY OF COAL SPOILS MATERIALS AS THAT LEACHABILITY MAY AFFECT THE QUALITY OF SHALLOW GROUND WATER SUPPLIES IN THE NORTHERN GREAT PLAINS. THE PROPOSED PROJECT IS RECONNAISSANCE IN NATURE AND COULD ALSO SERVE TO INDICATE NEED FOR CONTINUING OR REDIRECTED EFFORTS TO EVALUATE THE IMPACT ON GROUND WATER QUALITY. OVER 50 LEACHING EXPERIMENTS UTILIZING COAL MINE SPOIL MATERIAL FROM COLSTRIP AND DECKER, MONTANA INDICATE THAT THE SPOILS CONTAIN LARGE QUANTITIES OF READILY SOLUBLE INORGANIC SALTS.

REPORTS AND PUBLICATIONS:
FINAL REPORT, ORDER NO. 4-110-00714

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00000316

PROJECT TITLE:
MINERALOGY OF OVERBURDEN AS RELATED TO GROUNDWATER DEGRADATION IN THE STRIP MINING OF COAL

PROJECT NUMBER:
R804152-01

INVESTIGATORS:
COLORADO SCHOOL OF MINES RESEARCH INSTITUTE
P.O. BOX 112
GOLDEN, CO 80401

PROJECT SUPERVISOR:
BOB NEWPORT
U.S. EPA, ROBT. S. KERR ENVIRONMENTAL RESEARCH LAB.
POST OFFICE BOX 1198
ADA, OK 74820

PRIMARY SPONSOR:
U.S. EPA, ROBT. S. KERR ENVIRONMENTAL RESEARCH LAB.
BOB NEWPORT
P.O. BOX 1198
ADA, OK 74820

PRIMARY FUNDING AMOUNT:
300,000

TIME FRAME:
11 01 75 TO 11 01 76

LOCATION:
CO - NW CO, EXACT LOCATION TO BE DETERMINED AS PART OF PROJECT.

ABSTRACT:
THE OBJECTIVE IS TO DEVELOP A METHOD OF PREDICTING POTENTIAL GROUNDWATER DEGRADATION IN STRIP COAL MINING ON THE BASIS OF THE MINERALOGY OF THE OVERBURDEN. THE MINERALOGY OF OVERBURDEN CORE SAMPLES WILL BE DETERMINED AND COMPARED WITH THE MINERALOGY OF SIMILAR MATERIAL THAT HAS UNDERGONE EXTENSIVE CHEMICAL WEATHERING IN OLD SPOIL PILES. THE GROUNDWATER DEGRADATION THAT HAS RESULTED FROM LEACHING

THROUGH THE OLD SPOILS WILL ALSO BE DETERMINED QUALITATIVELY AND QUANTITATIVELY. THIS FIELD-ORIENTED, CAUSE-AND-EFFECT APPROACH WILL HELP TO ESTABLISH THE RELATIONSHIP BETWEEN THE MINERALOGY OF OVERBURDEN AND POTENTIAL GROUNDWATER DEGRADATION.

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00000317
PROJECT TITLE:
SURFACE MINING AND WATER RESOURCES IN THE SOUTHWEST
INVESTIGATORS:
TIKA R. VERMA; MARTIN M. FOGEL
PROJECT SUPERVISOR:
JOHN L. THAMES
UNIV. OF ARIZONA
TUCSON, AZ 85721
PRIMARY SPONSOR:
U.S. BUREAU OF MINES, DENVER MIN. RESEARCH CENTER
GARY E. MCINTOSH
DENVER FEDERAL CENTER, BLDG. 20
DENVER, CO 80225
SECONDARY SPONSORS:
UNIV. OF ARIZONA
PRIMARY FUNDING AMOUNT:
57,500
SECONDARY FUNDING AMOUNT:
19,304
TIME FRAME:
05 23 75 TO 06 23 77
LOCATION:
AZ - BLACK MESA
ABSTRACT:

THE PROBLEMS OF SURFACE MINING IN THE ARID AREAS OF THE SOUTHWEST PRESENT ALL THE NORMAL PROBLEMS OF SURFACE MINING AUGMENTED BY THE VERY SPARSE AND OFTEN ERRATIC RAINFALL OF THE AREA. SCHEMES APPLICABLE TO OTHER REGIONS WILL MOST LIKELY FAIL IN THE STUDY AREA MAKING SATISFACTORY RECLAMATION, IN THE COMMON SENSE OF THE WORD, VIRTUALLY IMPOSSIBLE.

THE APPROACH PROPOSED BY THE UNIVERSITY OF ARIZONA TAKES INTO ACCOUNT THE UNIQUE FEATURES OF THE AREA AND WILL ATTEMPT TO MAKE MAXIMUM USE OF AVAILABLE WATER TO STABILIZE THE SURFACE AND RETURN IT TO PRODUCTIVE USE WHILE MINIMIZING THE ADVERSE EFFECTS OF THE SURFACE DISTURBANCE.

TO DEVELOP OPTIMAL SURFACE CONFIGURATION AND/OR SURFACE TREATMENT FOR RECLAIMED AREAS WHICH WILL MAXIMIZE THE WATER USAGE BY ON-SITE VEGETATION, MINIMIZE SURFACE RUN OFF AND PREDICT THE PROBABLE EFFECT OF MINING AND RECLAMATION ON THE HYDROLOGY OF THE AREA.

THE DEVELOPMENT OF OPTIMUM SURFACE CONFIGURATION WILL PROVIDE AN EXAMPLE FOR MINES, OPERATING UNDER SIMILAR CIRCUMSTANCES, AS TO WHAT CAN BE DONE TO ENHANCE FUTURE LAND USE AND MINIMIZE THE IMPACT OF SURFACE MINING.

TYPE OF STUDY:
PART OF ´SURFACE MINING, EXTRACTION, RECLAMATION SUBPROGRAM´. U.S. BUREAU OF MINES.

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00000318
PROJECT TITLE:
INVESTIGATION AND DEMONSTRATION OF THE UTILITY OF FALSE COLOR IR PHOTOGRAPHY FOR MINING AND RECLAMATION PLANNING AND MONITORING.
PROJECT SUPERVISOR:
WILLIAM KUNTZ
HRB SINGER
STATE COLLEGE, PA
PRIMARY SPONSOR:
U.S. BUREAU OF MINES, DIV. OF ENVIRONMENT
P. MARCUS
2401 E. ST. NW
WASHINGTON, DC 20241
PRIMARY FUNDING AMOUNT:
237,000
TIME FRAME:
05 30 75 TO 01 30 78
ABSTRACT:

EXISTING AND PENDING MINED LAND RECLAMATION STATUTES MAKE THOROUGH PREPLANNING OF MINING AND RECLAMATION OPERATIONS VIRTUALLY MANDATORY IN ORDER TO OBTAIN A PERMIT. EFFECTIVE MINE PLANNING, THEREFORE, BECOMES A CRITICAL STEP THAT MUST NOW TAKE INTO CONSIDERATION PARAMETERS OTHER THAN EXPEDITIOUS EXTRACTION OF THE RESOURCE. ENFORCEMENT OF ENVIRONMENTAL PROTECTION REQUIREMENTS AND RECLAMATION IS NOW ALSO A CRITICAL PROCESS. TO EXPEDITE BOTH FUNCTIONS, THIS PROJECT WILL INVESTIGATE THE FEASIBILITY AND COST EFFECTIVE UTILITY OF AERIAL FALSE COLOR INFRARED IMAGERY AS A TOOL FOR MINING AND RECLAMATION PLANNING AND MONITORING.

TYPE OF STUDY:
PART OF ´SURFACE MINING, EXTRACTION, RECLAMATION SUBPROGRAM´, U.S. BUREAU OF MINES.

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00000319
PROJECT TITLE:
ENHANCEMENT OF SHRUB AND TREE ESTABLISHMENT WITH DRIP IRRIGATIO AND USE OF CONTAINER-GROWN STOCK ON COAL MINE SPOILS IN CAMPBELL COUNTY, WYOMING.
PROJECT NUMBER:
EM-415

INVESTIGATORS:
ARDELL J. BJUGSTAD
PROJECT SUPERVISOR:
HOWARD K. ORR
SOUTH DAKOTA SCHOOL OF MINES & TECH., FOREST RESEARCH LAB.
RAPID CITY, SD 57701
COOPERATOR:
AMAX, INC.
U.S. DEPT. OF AG., SOIL CONSERVATION SERVICE
PRIMARY SPONSOR:
U.S. FOREST SERVICE, SURFACE ENVIRONMENT AND MINING
145 GRAND AVE.
BILLINGS, MT 59102
PRIMARY FUNDING AMOUNT:
1975 - 7,500 ; 1976 - 5,500 ; 1977 - 3,000
TIME FRAME:
03 01 75 TO 03 01 78
LOCATION:
WY - BELLE AYR SOUTH MINE
ABSTRACT:

OBJECTIVES: TO DETERMINE IF SUPPLEMENTAL MOISTURE (DRIP IRRIGATION) AND USE OF CONTAINER-GROWN GREENHOUSE STOCK WILL IMPROVE THE ESTABLISHMENT AND INITIAL GROWTH OF SELECTED TREE AND SHRUB SPECIES COMPARED WITH DRYLAND CULTURE AND BARE ROOT STOCK.

METHODS: 1ST YEAR, 7 SPECIES WILL BE PLANTED BARE ROOT, ONE 42-PLANT ROW OF EACH SPECIES IN EACH OF 5 BLOCKS. PLANTS WILL BE 6 FEET APART IN ROWS 8 FEET APART. THE SIDE-BY-SIDE BLOCKS WILL BE EVENLY DIVIDED CROSSWAYS INTO 3 14-PLANT SEGMENTS, EACH SEGMENT TO RECEIVE AN ANIMAL REPELLENT TREATMENT. EACH 14-PLANT ROW SEGMENT WILL BE FURTHER DIVIDED INTO 2 7-PLANT PARTS, ONE OF WHICH WILL BE LEFT IN DRY LAND CULTURE AND ALL THE PLANTS IN THE OTHER WILL BE DRIP IRRIGATED AT THE RATE OF 1 GALLON EACH 4 DAYS, MAY 1 - SEPTEMBER 30. SECOND YEAR THE ENTIRE SET-UP WILL BE INTERPLANTED WITH THE SAME SPECIES, 6 PLANTS IN EACH 7-PLANT PART, 3 OF WHICH WILL BE CONTAINER-GROWN AND 3 BARE ROOT FROM THE SAME SEED SOURCE. SPECIES INCLUDE GREEN ASH, RUSSIAN OLIVE, ROCKY MOUNTAIN JUNIPER, SILVER BUFFALOBERRY, PONDEROSA PINE, AMERICAN PLUM, AND SIBERIAN PEASHRUB. FIRST YEAR COMPARISONS, ANOV, WILL INVOLVE SPECIES, DRYLAND CULTURE AND DRIP IRRIGATION. SECOND AND THIRD YEAR COMPARISONS WILL INVOLVE THE SAME FACTORS PLUS CONTAINER-GROWN VERSUS BARE ROOT STOCK, IRRIGATED AND NON-IRRIGATED.

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00000320
PROJECT TITLE:
REVEGETATION OF AREAS DISTURBED BY MAN IN THE CENTRAL HIGH PLAINS WITH TREES, SHRUBS AND OTHER WOODY PLANTS
PROJECT NUMBER:
5609-16010-001
INVESTIGATORS:
GERALD E. SCHUMAN; FRANK RAUII; GENE S. HOWARD
PROJECT SUPERVISOR:
GENE S. HOWARD
U.S. AG. RESEARCH SERVICE
RT. 1 BOX 698
CHEYENNE, WY 82001
PRIMARY SPONSOR:
U.S. AG. RESEARCH SERVICE
PRIMARY FUNDING AMOUNT:
FY 75 - 27,000; FY 76 - 27,000
TIME FRAME:
01 17 75 TO 01 17 78
LOCATION:
WY
ABSTRACT:

PROBLEM: REHABILITATION OF LARGE COAL STRIP-MINED AREAS, ALSO URANIUM SPOILS. NEED TO EVALUATE TREES, SHRUBS AND WOODY PLANT SPECIES THAT WILL BECOME ESTABLISHED UNDER THE ADVERSE SOIL CONDITIONS PRESENT AFTER MINING.

OBJECTIVES: TO SELECT, PROPAGATE OR SEED TREES, SHRUBS AND OTHER WOODY PLANT SPECIES FOR USE IN RECLAIMING SPECIAL PROBLEM SITES OR AREAS DISTURBED BY MAN FOR RECREATIONAL, AESTHETIC OR OTHER PURPOSES.

APPROACH: SEEDING AND HARDWOOD AND SOFTWOOD CUTTING PROPAGATION TECHNIQUES WILL BE USED TO PRODUCE PLANT POPULATIONS. VARIOUS TEMPERATURES UNDER CUTTINGS IN THE ROOTING MEDIUM AND VARIOUS ROOTING HORMONE SOLUTIONS WILL BE TESTED TO ENHANCE ROOTING OF SPECIES THAT ARE DIFFICULT TO ROOT FROM CUTTINGS. NEWLY PROPAGATED CUTTINGS WILL REQUIRE ONE OR TWO YEARS GROWTH IN THE LATH HOUSE TO ATTAIN PROPER SIZE FOR FIELD PLANTING. PLANTINGS WILL BE MADE IN RECLAIMED SOILS SUITABLE TO SUSTAIN PLANT GROWTH AND THOSE THAT HAVE BEEN SHAPED TO CATCH AND HOLD MOISTURE AND FAVOR PLANT ESTABLISHMENT. MANY OF THE ADAPTABLE SPECIES HAVE SELDOM, IF EVER BEEN TESTED IN DISTURBED LAND RECLAMATIONS TRIALS. COOPERATIVE TRIALS WILL BE CONDUCTED AT EXISTING EXPERIMENTAL SITES NOW BEING USED BY SCIENTISTS AT THE UNIVERSITY OF WYOMING. SUITABLE NEW SITES MAY BE ADDED WHEN ADEQUATE PLANT POPULATIONS BECOME AVAILABLE. THESE SITES MAY INCLUDE RECLAIMED AREAS USED FOR RECREATION, SOME OF WHICH HAVE WATER IMPOUNDED IN LAKES.

REPORTS AND PUBLICATIONS:
R. LAND, F. RAUII, W. SEAMANDS AND G. HOWARD. 1975. GUIDELINES FOR SEEDING DRYLAND RANGE, PASTURE, AND DISTURBED LANDS. AGRICULTURAL EXPERIMENT STATION BULLETIN NO. 621. UNIVERSITY OF WYOMING, 11P.

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00000321
PROJECT TITLE:
CHEMISTRY AND SOIL-WATER-PLANT RELATIONSHIPS OF DISTURBED LANDS AND THEIR EFFECTS ON REVEGETATION.
PROJECT NUMBER:
5609-16010-002
INVESTIGATORS:
GENE HOWARD; FRANK RAUZI; GERALD E. SCHUMAN
PROJECT SUPERVISOR:
GERALD E. SCHUMAN
U.S. AG. RESEARCH SERVICE
RT. 1 BOX 698
CHEYENNE, WY
PRIMARY SPONSOR:
U.S. AG. RESEARCH SERVICE
PRIMARY FUNDING AMOUNT:
FY 76 - 80,000
TIME FRAME:
10 03 75 TO 10 03 80
LOCATION:
WY
ABSTRACT:

PROBLEM: WYOMING HAS LARGE AMOUNTS OF STRIPPABLE COAL WHICH WILL BE MINED TO HELP MEET THE NATIONS ENERGY DEMANDS. THESE AREAS WILL REQUIRE REHABILITATION TO MAINTAIN A QUALITY ENVIRONMENT. MUCH BASIC SOILS RESEARCH IS NEEDED TO DETERMINE THE MOST FEASIBLE MEANS OF REHABILITATING THESE AREAS.

OBJECTIVES: TO DETERMINE THE SOIL CHEMICAL AND SOIL-WATER PROPERTIES THAT ARE LIMITING FACTORS IN REVEGETATION OF LANDS DISTURBED BY MAN. DEVELOP METHODS OF LAND SURFACE MODIFICATION TO EHANCE SNOW ACCUMULATION AND REDUCE SURFACE RUNOFF.

APPROACH: CHEMICALLY CHARACTERIZE THE SOILS BEFORE THE MINING OPERATION TO DETERMINE WHAT SOIL HORIZONS IN THE OVERBURDEN WILL BEST SUSTAIN PLANT GROWTH. CHEMICALLY CHARACTERIZE THE SOIL OF THE AREAS WHERE MINING HAS TAKEN PLACE TO HELP SELECT PLANT SPECIES THAT ARE TOLERANT TO THE TOXIC ELEMENTS OR COMPOUNDS PRESENT AND TO DETERMINE IF INORGANIC OR ORGANIC ADDITIVES CAN BE APPLIED TO IMPROVE THE SOIL-PLANT ENVIRONMENT. USE LAND SURFACE MODIFICATION AND PLANTING TECHNIQUES TO TRAP SNOW AND REDUCE RUNOFF FOR INCREASED WATER STORAGE FOR PLANT ESTABLISHMENT AND GROWTH. VARIOUS ORGANIC MULCHES WILL ALSO BE TESTED TO DETERMINE THEIR EFFECT ON WATER INTAKE, WATER HOLDING CAPACITY AND ON REDUCING EROSION. FERTILIZER AND ORGANIC WASTES WILL BE APPLIED TO MINE SPOILS TO IMPROVE PLANT GROWTH AND INCREASE THE ORGANIC RESIDUE LEVEL.

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00000322
PROJECT TITLE:
STUDY OF POSSIBLE EFFECTS OF STRIP COAL MINING ON THE
HYDROLOGIC SYSTEM IN EASTERN MONTANA
PROJECT SUPERVISOR:
WAYNE VAN VOAST
MONTANA BUREAU OF MINES & GEOLOGY
ROOM 111 - SIXTH AVE. PLAZA
3021 SIXTH AVE. N.
BILLINGS, MT 59101
PRIMARY SPONSOR:
MONTANA STATE UNIV., WATER RESOURCES RESEARCH CENTER
BOZEMAN, MT
PRIMARY FUNDING AMOUNT:
28,000
TIME FRAME:
06 30 73 TO 06 30 76
LOCATION:
MT
ABSTRACT:
MONITORING SYSTEM, PUMPING TESTS, CHEMICAL ANALYSES TO
DETERMINE QUANTITY, QUALITY, AND TRANSMISSIVITY OF WATER
IN THE MINING AREAS.
REPORTS AND PUBLICATIONS:
MONTANA BUREAU OF MINES & GEOLOGY. BULL. 93 AND BULL 97;
FORT UNION COAL SYMPOSIUM, VOL. III.

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00000323
PROJECT TITLE:
PREMINING HYDROLOGIC EVALUATIONS NORTH AND EAST OF
DECKER, MONTANA.
PROJECT SUPERVISOR:
WAYNE VAN VOAST
MONTANA BUREAU OF MINES & GEOLOGY
ROOM 111 - SIXTH AVENUE PLAZA
3021 SIXTH AVE. N.
BILLINGS, MT 59101
PRIMARY SPONSOR:
DECKER COAL CO.
BOX 736
SHERIDAN, WY 82801
PRIMARY FUNDING AMOUNT:
15,689
TIME FRAME:
07 01 74 TO 06 30 75
STATUS:
COMPLETED 06 30 75
LOCATION:
MT
ABSTRACT:
PART OF A LONG RANGE GROUNDWATER MONITORING PROGRAM.
INTERPRETATION OF DATA.
REPORTS AND PUBLICATIONS:
MONTANA BUREAU OF MINES AND GEOLOGY. BULL 93 AND BULL 97;
FORT UNION COAL SYMPOSIUM, VOL. III.

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00000324
PROJECT TITLE:
HYDROLOGY OF WESTERN ENERGY COMPANY'S PROBABLE MINE AREAS
PROJECT SUPERVISOR:
WAYNE VAN VOAST
MONTANA BUREAU OF MINES & GEOLOGY
ROOM 111 - SIXTH AVENUE PLAZA
3021 SIXTH AVE. N.
BILLINGS, MT 59101
PRIMARY FUNDING AMOUNT:
65,514
TIME FRAME:
06 30 73 TO 06 30 76
LOCATION:
MT
ABSTRACT:
DETERMINE AND INTERPRET CURRENT HYDROLOGIC CONDITIONS,
DETECT ANY CHANGES IN WATER QUALITY, ARTESIAN PRESSURES,
AND STREAM DISCHARGE AS MINING AND RECLAMATION PROCEEDS.
REPORTS AND PUBLICATIONS:
WESTERN ENERGY OPEN FILE; FORT UNION COAL SYMPOSIUM, VOL. III.

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00000325
PROJECT TITLE:
SHALLOW GROUNDWATER STUDY RELATED TO COAL IN SPECIFIED
AREAS OF THE POWDER RIVER BASIN, MONTANA AND WYOMING.
PROJECT SUPERVISOR:
WAYNE VAN VOAST
MONTANA BUREAU OF MINES & GEOLOGY
ROOM 111 - SIXTH AVENUE PLAZA
3021 SIXTH AVE. N.
BILLINGS, MT 59101
PRIMARY SPONSOR:
NORTHERN GREAT PLAINS RESOURCES PROGRAM
PRIMARY FUNDING AMOUNT:
28,000
TIME FRAME:
01 01 74 TO 06 30 74

STATUS:
COMPLETED 06 30 74
LOCATION:
MT WY - POWDER RIVER BASIN
ABSTRACT:
SHALLOW GROUNDWATER STUDY RELATED TO COAL IN SPECIFIED AREAS OF THE POWDER RIVER BASIN, MONTANA AND WYOMING.
REPORTS AND PUBLICATIONS:
MONTANA BUREAU OF MINES AND GEOLOGY. BULL 93 AND BULL 97; FORT UNION COAL SYMPOSIUM, VOL. III.

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00000326
PROJECT TITLE:
GROUNDWATER PROBLEMS ASSOCIATED WITH POTENTIAL STRIP MINE SITES
INVESTIGATORS:
S. K. PAGENKOPF; P. W. JENNINGS
MONTANA STATE UNIV.
PROJECT SUPERVISOR:
WAYNE VAN VOAST
BILLINGS, MT 59101
MONTANA BUREAU OF MINES & GEOLOGY
ROOM 111 - SIXTH AVENUE PLAZA
3021 SIXTH AVE. N.
COOPERATOR:
MONTANA STATE UNIV.; MONTANA BUREAU OF MINES AND GEOLOGY
PRIMARY SPONSOR:
U.S. EPA
PRIMARY FUNDING AMOUNT:
72,855
TIME FRAME:
06 01 75 TO 05 01 78
LOCATION:
MT
ABSTRACT:
GATHER DATA ON WATER FLOW AND CHEMISTRY OF SELECTED MINE SPOILS, DEVELOP MODELS TO SIMULATE PRE- AND POST-MINING SYSTEMS, AND SIMULATE AND PREDICT FLOW QUANTITY AND QUALITY SO THAT ALTERNATE MINING AND RECLAMATION TECHNIQUES MAY BE RELIABLY EVALUATED.
REPORTS AND PUBLICATIONS:
MONTANA BUREAU OF MINES AND GEOLOGY. BULL 93 AND BULL. 97; WESTERN ENERGY OPEN FILE; FORT UNION COAL SYMPOSIUM, VOL. III.

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00000327
PROJECT TITLE:
EVALUATION OF AQUIFERS ASSOCIATED WITH POTENTIAL COAL DEVELOPMENT, SOUTHEASTERN MONTANA
PROJECT SUPERVISOR:
WAYNE VAN VOAST
MONTANA BUREAU OF MINES & GEOLOGY
ROOM 111 - SIXTH AVENUE PLAZA
3021 SIXTH AVE. N.
BILLINGS, MT 59101
PRIMARY SPONSOR:
U.S. GEOLOGICAL SURVEY
PRIMARY FUNDING AMOUNT:
50,000
TIME FRAME:
08 31 74 TO 09 01 75
STATUS:
COMPLETED 09 01 75
LOCATION:
MT
ABSTRACT:
DRILL AND MONITOR WELLS TO DETERMINE THE DEPTH AND HYDROLOGIC AND GEOLOGIC CHARACTERISTICS OF AQUIFERS AND THE QUALITY OF WATER BEFORE, DURING, AND AFTER MINING.
REPORTS AND PUBLICATIONS:
MONTANA BUREAU OF MINES AND GEOLOGY. BULL. 93 AND BULL. 97.

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00000328
PROJECT TITLE:
MINING RELATED HYDROLOGIC EVALUATIONS NEAR THE BIG SKY MINE, SOUTHEASTERN MONTANA.
PROJECT SUPERVISOR:
WAYNE VAN VOAST
MONTANA BUREAU OF MINES & GEOLOGY
ROOM 111 - SIXTH AVENUE PLAZA
3021 SIXTH AVE. N.
BILLINGS, MT 59101
PRIMARY SPONSOR:
PEABODY COAL CO.
PRIMARY FUNDING AMOUNT:
23,444
TIME FRAME:
03 10 75 TO 06 30 76
LOCATION:
MT
ABSTRACT:
GATHER AND INTERPRET BASE-LINE HYDROLOGIC DATA LEADING TO A FIRM UNDERSTANDING OF THE LOCAL HYDROLOGIC SYSTEM.

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00000329
PROJECT TITLE:
PREMINING HYDROLOGIC EVALUATIONS IN THE SOUTHERN PART OF THE CROW INDIAN RESERVATION, SOUTHEASTERN MONTANA
PROJECT SUPERVISOR:
WAYNE VAN VOAST
MONTANA BUREAU OF MINES & GEOLOGY
ROOM 111 - SIXTH AVENUE NORTH
3021 SIXTH AVE. N.
BILLINGS, MT 59101
PRIMARY SPONSOR:
SHELL OIL
PRIMARY FUNDING AMOUNT:
35,720
TIME FRAME:
10 01 74 TO 06 30 76
LOCATION:
MT
ABSTRACT:
MAINTAIN ESTABLISHED OBSERVATION PROGRAM, EXPAND AREA, AND INTERPRET AREA.
REPORTS AND PUBLICATIONS:
HYDROLOGY OF THE SHELL OIL COAL LEASE, YOUNG´S CREEK AREA, SOUTHEASTERN MONTANA.

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00000330
PROJECT TITLE:
ESTIMATION OF AMENITY VALUES AS OPPORTUNITY COSTS FOR ENERGY-RELATED WATER USE IN MONTANA
PROJECT SUPERVISOR:
RICHARD L. STROUP
MONTANA STATE UNIV., AG. ECON. & ECONOMICS DEPT.
BOZEMAN, MT 59715
COOPERATOR:
MONTANA DEPT. OF NATURAL RESOURCES AND CONSERVATION
MONTANA DEPT. OF FISH AND GAME
PRIMARY SPONSOR:
MONTANA STATE UNIV., WATER RESOURCES RESEARCH CENTER
BOZEMAN, MT 59715
PRIMARY FUNDING AMOUNT:
66,453
TIME FRAME:
03 01 75 TO 03 31 76
LOCATION:
MT
ABSTRACT:
THE OBJECTIVES OF THIS STUDY ARE TO DEVELOP, APPLY AND TEST METHODOLOGIES, WITH WHICH TO EVALUATE THE IN-STREAM RECREATION AND AESTHETIC VALUES OF WATER BEING CONSIDERED FOR CONSUMPTION BY ENERGY CONVERSION OPERATIONS IN MONTANA. FULFILLMENT OF THESE THREE OBJECTIVES WILL PROVIDE PRACTICAL, CONCEPTUALLY SOUND TOOLS FOR IMPORTANT WATER USE DECISIONS. THIS OPPORTUNITY COST SIDE OF THE DECISION QUESTION IS REQUIRED FOR COMPLETION OF THE ANALYSIS BEGUN IN THE CURRENT PROJECT ´WATER USE AND COAL DEVELOPMENT IN EASTERN MONTANA: WATER AVAILABILITY, WATER DEMANDS, AND ECONOMIC IMPACTS´ FUNDED BY OWRR, WITH RICHARD STROUP AS CO-PRINCIPAL INVESTIGATOR.

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00000331
PROJECT TITLE:
ROSEBUD CREEK BENTHIC INVERTEBRATE AND WATER QUALITY STUDY, COLSTRIP, MONTANA.
PROJECT SUPERVISOR:
ROBERT E. CARROLL
ECOLOGICAL CONSULTING SERVICE
AIRPORT WAY BUILDING WEST
HELENA, MT 59601
COOPERATOR:
PUGET SOUND POWER AND LIGHT
PRIMARY SPONSOR:
MONTANA POWER CO.
CARL R. ANDERSON
40 E. BROADWAY
BUTTE, MT 59701
PRIMARY FUNDING AMOUNT:
PROPRIETARY
TIME FRAME:
06 01 75 TO 01 01 76
LOCATION:
MT - COLSTRIP
ABSTRACT:
A DETERMINATION OF THE DIVERSITY AND BIOMASS OF ANIMAL AND PLANT LIFE LIVING ON THE RIVER BOTTOM OF ROSEBUD CREEK.
ANALYSIS OF 25 PARAMETERS TO ESTABLISH WATER QUALITY CHARACTER OF ROSEBUD CREEK.

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00000332
PROJECT TITLE:
LIMNOLOGY OF THE TONGUE RIVER RESERVOIR; EXISTING AND POTENTIAL EFFECTS OF COAL STRIP MINING.
PROJECT SUPERVISOR:
RICHARD W. GREGORY

MONTANA STATE UNIV., BIOLOGY DEPT.
BOZEMAN, MT 59715

COOPERATOR:
U.S. FISH & WILDLIFE SERVICE
MONTANA DEPT. OF FISH & GAME
MONTANA DEPT. OF HEALTH & ENVIRONMENTAL SCIENCES
U.S. EPA

PRIMARY SPONSOR:
DECKER COAL CO.
SHERIDAN, WY 82801

PRIMARY FUNDING AMOUNT:
$5,260

TIME FRAME:
04 01 75 TO 06 30 79

LOCATION:
MT

ABSTRACT:

THE DECKER COAL CO. IS PRESENTLY OPERATING A LARGE OPEN-PIT MINE ADJACENT TO AND UPSTREAM FROM THE TONGUE RIVER RESERVOIR. PERIODIC DISCHARGES FROM A SETTLING POND, USED TO RECEIVE SEEP WATER PUMPED FROM THE MINE PRESENTLY ENTER THE RESERVOIR FROM THE SOUTHWEST. TWO ADDITIONAL MINES ARE SCHEDULED TO BE OPENED IN 1976 OR 1977 ON THE EAST AND WEST BANKS OF THE RESERVOIR. THERE IS CONCERN ABOUT THE IMMEDIATE AND LONG TERM EFFECTS OF THE MINING OPERATIONS AND SETTLING POND EFFLUENTS ON IMPORTANT LIMNOLOGICAL PARAMETERS OF THE RESERVOIR. NOTHING IS PRESENTLY KNOWN OF THE LIMNOLOGY OF THE RESERVOIR OR THE POTENTIAL IMPACT OF SURFACE COAL MINING.

PARAMETERS LISTED WILL BE MEASURED PRIOR TO OPENING ANY NEW MINES. MONITORING WILL CONTINUE DURING ADDITIONAL MINING OPERATIONS AND SUBSEQUENT RECLAMATION TO TEST PREDICTED IMPACT. DATA WILL BE CORRELATED WITH CONCURRENT FISHERY INVESTIGATIONS PRESENTLY UNDERWAY AT THE RESERVOIR.

OBJECTIVES: 1. TO MEASURE AND MAP THE MORPHOMETRY OF THE RESERVOIR BASIN.

2. TO PREPARE A NUTRIENT BUDGET FOR THE RESERVOIR BY DETERMINING INFLOW, OUTFLOW AND STORAGE OF CRITICAL CHEMICAL ELEMENTS.

3. TO STUDY THE EFFECT OF THE SETTLING POND EFFLUENT ON THE RESERVOIR.

4. TO DETERMINE THE SIZE, PRODUCTION AND FLUSHING LOSS OF PHYTOPLANKTON AND ZOOPLANKTON POPULATIONS.

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00000333

PROJECT TITLE:
YELLOWSTONE-TONGUE WATER QUALITY MANAGEMENT PROJECT

INVESTIGATORS:
CLARK JUDY; CAROL HARLOW; AMBREY GARTNER

PROJECT SUPERVISOR:
FLOYD IRION, CHAIRMAN
YELLOWSTONE-TONGUE APO
BROADUS, MT 59317

PRIMARY SPONSOR:
U.S. EPA
1869 LINCOLN ST.
DENVER, CO 80203

PRIMARY FUNDING AMOUNT:
$40,000

TIME FRAME:
07 15 75 TO 09 15 77

LOCATION:
MT - CARTER, CUSTER, FALLON, POWDER RIVER, ROSEBUD, AND TREASURE COUNTIES AND THE NORTHERN CHEYENNE INDIAN RESERVATION

ABSTRACT:

THE WATER QUALITY MANAGEMENT PROJECT IS FUNDED UNDER SECTION 208 OF PL 92-500. MOST OF THE EFFORT WILL BE DIRECTED TOWARD UTILIZING EXISTING DATA FOR PLANNING PURPOSES, BUT SOME NEW DATA WILL BE COLLECTED.

CONSULTANTS AND GOVERNMENT AGENCIES WILL BE GIVEN CONTRACTS TO DEVELOP SEWAGE TREATMENT FACILITIES PLANS, GROUNDWATER MAPS, LAND USE MAPS, NONPOINT SOURCE WATER QUALITY DATA, AND INFORMATION ON LAND USE/WATER GUALITY RELATIONSHIPS. SEVERAL INTERIM REPORTS WILL BE AVAILABLE. THE FINAL PLAN WILL BE COMPLETED IN 1977.

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00000334

PROJECT TITLE:
A CONCEPTUAL STUDY OF A MISSOURI RIVER-WYOMING AQUEDUCT

INVESTIGATORS:
FLOYD MATTHEW
CONSOLIDATED ENGINEERING
BOX 2830, 306 EAST ST. JOSEPH ST.
RAPID CITY, SD

PROJECT SUPERVISOR:
ED GLASSGOW, MANAGER
BLACK HILLS CONSERVANCY SUB-DISTRICT
P.O. BOX 1692
RAPID CITY, SD

COORDINATOR:
KEITH KUCHENBECKER, MANAGER
WEST RIVER CONSERVANCY SUB-DISTRICT
PHILIP, SD

PRIMARY SPONSOR:
BLACK HILLS CONSERVANCY SUB-DISTRICT
WEST RIVER CONSERVANCY SUB-DISTRICT

SECONDARY SPONSORS:
MAY GOORS, DIRECTOR
SOUTH DAKOTA ENERGY POLICY OFFICE
(FEDERAL ENERGY ADMINISTRATION)

CAPITOL BUILDING
PIERRE, SD 57501

PRIMARY FUNDING AMOUNT:
35,000

TIME FRAME:
01 01 75 TO 12 31 75

STATUS:
COMPLETED 12 09 75

LOCATION:
SD WY - WESTERN SOUTH DAKOTA AND EASTERN WYOMING IN GILLETTE AREA.

ABSTRACT:

THE CONCEPTUAL STUDY OF A MISSOURI RIVER-WYOMING AQUEDUCT WAS UNDERTAKEN TO: 1. IDENTIFY WATER NEEDS IN WESTERN SOUTH DAKOTA THAT COULD BE SATISFIED BY AN AQUEDUCT. 2. EVALUATE PHYSICAL, MANAGEMENT AND FINANCING ALTERNATIVES. 3. IDENTIFY RESTRAINTS TO THE CONCEPT. 4. DEVELOP A RECOMMENDED PLAN OF ACTION.

FOUR AQUEDUCT ROUTES, THREE MANAGEMENT SYSTEMS (FEDERAL, STATE AND PRIVATE OWNERSHIP) AND SEVERAL FINANCING ALTERNATIVES WERE STUDIED TO ARRIVE AT A BASIC SYSTEM CONCEPT WHICH WAS THEN EVALUATED.

THE SYSTEM CONSISTED OF AN AQUEDUCT 72 INCHES IN DIAMETER RUNNING 285 MILES FROM OAHE RESERVOIR TO GILLETTE, WYOMING. IT WOULD DELIVER 25,000 AF TO WESTERN SOUTH DAKOTA AND 100,000 AF TO WYOMING. THE CONCEPTUAL SYSTEM WOULD BE CONSTRUCTED AND OPERATED BY THE STATES OF SOUTH DAKOTA AND WYOMING UTILIZING INDUSTRIAL REVENUE BONDS. 1980 ESTIMATED INVESTMENT COST WOULD BE $670 MILLION WITH ANNUAL OPERATING COSTS FOR AMORTIZATION, OM&R, PUMPING POWER, AND WATER CHARGES OF $80 TO $95 MILLION. WATER CHARGES WOULD RUN $770 TO $900 PER ACRE FOOT WITH $100 BEING A SERVICE SURCHARGE.

THE BASIC SYSTEM CONCEPT WAS EVALUATED USING AN INVESTMENT ANALOGY. THE CONCEPT HAD TO MEET THE FOLLOWING CRITERIA: 1. A MARKET FOR IMPORTED INDUSTRIAL WATER MUST EXIST. 2. A MISSOURI RIVER-WYOMING AQUEDUCT MUST COMPARE FAVORABLY WITH OTHER ALTERNATIVES. 3. USERS MUST BE CAPABLE OF PAYING THE PRICE REQUIRED TO CONSTRUCT AND OPERATE THE SYSTEM. 4. NO OVER-RIDING FACTORS MUST BE PRESENT THAT WOULD RENDER THE PROPOSAL INFEASIBLE. 5. THE PROJECT MUST BE GOOD FOR SOUTH DAKOTA. 6. SOUTH DAKOTA MUST BE CAPABLE OF CARRYING THE PROJECT TO COMPLETION.

REPORTS AND PUBLICATIONS:
CONSOLIDATED ENGINEERING. 'A CONCEPTUAL STUDY OF A MISSOURI RIVER-WYOMING AQUEDUCT'. NOVEMBER, 1975. REPORT CAN BE OBTAINED FROM BLACK HILLS CONSERVANCY SUB-DISTRICT, P.O. BOX 1692, RAPID CITY, SOUTH DAKOTA, FOR $20.

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00000335

PROJECT TITLE:
HYDROLOGIC EVALUATION OF MINING AND RECLAMATION, HORSE NOSE BUTTE, DUNN COUNTY, NORTH DAKOTA

PROJECT NUMBER:
ND76-076

INVESTIGATORS:
J. S. DOWNEY
U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.
P.O. BOX 778, ROOM 332, NEW FEDERAL BLDG.
3RD ST. AND ROSSER AVE.
BISMARCK, ND 58501

PROJECT SUPERVISOR:
WALTER R. SCOTT, DISTRICT CHIEF
U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.
P.O. BOX 778, ROOM 332, NEW FEDERAL BLDG.
3RD ST. AND ROSSER AVE.
BISMARCK, ND 58501

PRIMARY SPONSOR:
U.S. BUREAU OF LAND MANAGEMENT

PRIMARY FUNDING AMOUNT:
51,570

TIME FRAME:
07 01 75 TO 06 30 76

LOCATION:
ND - DUNN COUNTY

ABSTRACT:

PRELIMINARY DATA INDICATE THAT THE PROPOSED LARGE EXPANSION OF MINING ACTIVITIES MAY RESULT IN CHANGES IN THE STREAMFLOW AND GROUNDWATER REGIMEN IN THE AREA (NORTHERN GREAT PLAINS RESOURCES PROGRAM--WATER WORK GROUP, 1974). SOME CHANGES WILL BE TEMPORARY, BUT OTHERS MAY REMAIN EVEN AFTER MINING HAS CEASED.

TO PROVIDE, ON BASIS OF OBSERVATIONS FROM THIS STUDY SITE, GUIDE LINES FOR MINING AND RECLAMATION THAT WILL MINIMIZE THE ADVERSE EFFECTS OF MINING ON THE HYDROLOGIC SYSTEM. THE HYDROLOGIC DATA ARE TO BE COMBINED WITH SOILS, COAL, AND VEGETATION INFORMATION IN A REPORT ON THE COAL RESOURCES AND RECLAMATION POTENTIAL OF THE AREA.

1. COLLATION AND EVALUATION OF ALL EXISTING HYDROLOGIC AND GEOCHEMICAL DATA FROM PRIOR STUDIES IN THE DUNN CENTER AREA. 2. SELECTION OF LOCATIONS AND INSTALLATION OF OBSERVATION WELLS IN THE STUDY AREA. 3. COLLECTION OF NEW HYDROLOGIC, GEOLOGIC AND GEOCHEMICAL DATA FROM PLANNED TEST DRILLING BY OTHER AGENCIES. 4. COLLECTION OF DATA CONCERNING SURFACE WATER FLOW. 5. DEVELOPMENT OF CONCEPTUAL MODEL OF THE HYDROLOGIC AND GEOCHEMICAL SYSTEM WHICH MAY BE USED TO PREDICT CHANGE CAUSED BY MINING.

TYPE OF STUDY:
PART OF 'ENERGY MINERAL REHABILITATION INVENTORY AND ANALYSIS-EMRIA', U.S. BUREAU OF LAND MANAGEMENT.

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00000336
PROJECT TITLE:
HYDROLOGIC EFFECTS OF STRIP MINING IN THE GASCOYNE AREA, BOWMAN COUNTY, NORTH DAKOTA
PROJECT NUMBER:
N075-0751
INVESTIGATORS:
MACK G. CROFT
U.S. GEOLOGICAL SURVEY
P.O. BOX 778, ROOM 332, NEW FEDERAL BLDG.
3RD ST. AND ROSSER AVE.
BISMARCK, ND 58501
PROJECT SUPERVISOR:
WALTER R. SCOTT, DISTRICT CHIEF
U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.
P.O. BOX 778, ROOM 332, NEW FEDERAL BLDG.
3RD ST. AND ROSSER AVE.
BISMARCK, ND 58501
PRIMARY SPONSOR:
U.S. BUREAU OF LAND MANAGEMENT
PRIMARY FUNDING AMOUNT:
300,000
TIME FRAME:
07 01 75 TO 06 30 75
LOCATION:
ND
ABSTRACT:

A PREVIOUS STUDY HAS INDICATED THAT THE LARGE EXPANSION OF STRIP MINING ACTIVITIES IN THE GASCOYNE AREA MAY RESULT IN CHANGES IN THE STREAMFLOW AND GROUNDWATER REGIMEN. MINE OVERBURDEN IN THE FORM OF SPOIL BANKS, INCREASES IN VOLUME OF THE ROCKS ABOUT 20 PERCENT AND THE ROCK PARTICLES OXIDIZE AND ERODE MORE EASILY BECAUSE OF THE INCREASED POROSITY AND PERMEABILITY. RUNOFF CONDITIONS AT THE MINE WILL CHANGE AND THE SILTLOAD OF THE STREAMS MAY INCREASE. RAPID WEATHERING OF OVERBURDEN WILL RESULT IN AN INCREASE IN DISSOLVED SOLIDS CONTENT OF SURFACE- AND GROUND-WATER DOWNGRADIENT FROM THE MINE.

THE PURPOSE OF THE INVESTIGATION IS TO DETERMINE AND EVALUATE THE EFFECTS UPON THE HYDROLOGIC SYSTEM CREATED BY THE EXPANSION OF THE GASCOYNE LIGNITE MINE. SPECIFICALLY, THE OBJECTIVES ARE TO: 1. MEASURE AND PREDICT THE CHANGES IN THE RUNOFF CHARACTERISTICS, SEDIMENT LOAD, AND WATER QUALITY OF STREAMS DRAINING THE MINE AREA; AND 2. DETERMINE THE LOCATION AND EXTENT OF THE MAJOR AQUIFERS AND PREDICT THE CHANGES IN CHEMICAL QUALITY OF WATER WITHIN THEM.

THE EXISTING HYDROLOGIC SYSTEM WILL BE SIMULATED WITH A DIGITAL CONCEPTUAL MODEL INVOLVING FINITE ELEMENT AND DIFFERENCE APPROXIMATIONS OF THE GROUNDWATER AND SURFACE-WATER FLOW EQUATION. DATA FOR THE MODELS WILL BE OBTAINED FROM NEW AND EXISTING TEST WELLS AND GAGING STATIONS.

TYPE OF STUDY:
PART OF 'ENERGY MINERALS REHABILITATION INVENTORY AND ANALYSIS - 'EMRIA, U.S. BUREAU OF LAND MANAGEMENT.

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00000337
PROJECT TITLE:
HYDROLOGIC EFFECTS OF SURFACE MINING, LAND REHABILITATION, AND LAND USE AS DEFINED BY RAINFALL SIMULATION
PROJECT NUMBER:
CR74-092 FI
INVESTIGATORS:
GREGG C. LUSBY
PROJECT SUPERVISOR:
RICHARD F. HADLEY
U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.
BOX 25046, DENVER FEDERAL CENTER
STOP 412
DENVER, CO 80225
PRIMARY SPONSOR:
U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.
SECONDARY SPONSORS:
U.S. BUREAU OF LAND MANAGEMENT
PRIMARY FUNDING AMOUNT:
FY 76 - 40,300
SECONDARY FUNDING AMOUNT:
FY 76 - 35,000
TIME FRAME:
07 01 73 TO 06 30 76
LOCATION:
11 WESTERN STATES
ABSTRACT:

THE OBJECTIVES OF THE STUDY INCLUDE: 1. QUANTITATIVE CHARACTERIZATION OF A VARIETY OF SOIL-VEGETATION COMPLEXES WITH REGARD TO SURFACE FLOW, SEDIMENT YIELD, AND SUSCEPTIBILITY TO EROSION. 2. DETERMINATION OF THE BASIC PROCESSES CONTROLLING RUNOFF AND EROSION FROM UPLAND AREAS, AND 3. DETERMINATION OF THE EFFECTS OF VARIOUS TYPES OF LAND USE. IT IS NOT THE OBJECTIVE OF THIS STUDY TO EXTRAPOLATE DIRECTLY FROM UPLAND BASINS TO LARGER DOWNSTREAM AREAS. IT IS, HOWEVER, THE PRIMARY OBJECTIVE OF THE STUDY TO FURNISH THE NECESSARY HYDROLOGIC DATA THAT WILL ASSIST IN REGIONAL RECONNAISSANCE STUDIES WITH THE PURPOSE OF ESTIMATING THE ENVIRONMENTAL IMPACTS OF LAND USE. ONE OF THE LAND USES TO BE EVALU-

ATED AS PART OF THE OVERALL STUDY IS SURFACE MINING. THE PRESENT PHASE OF THE STUDY CONSISTS OF CHARACTERIZING SURFACE HYDROLOGY CONDITIONS ON UNDISTURBED SITES AT COAL LEASE TRACTS ADMINISTERED BY THE BUREAU OF LAND MANAGEMENT. THIS WORK IS BEING DONE COOPERATIVELY AS PART OF THE EMRIA PROGRAM. THE OBJECTIVE OF THE STUDIES IS TO AID IN ASSESSING THE RECLAMATION POTENTIAL OF THE SITES STUDIED. THE PRIMARY TOOL USED IN ATTAINING THE OBJECTIVE IS A RAINFALL SIMULATOR WHICH APPLIES A STANDARD STORM TO ABOUT 4,000 SQUARE FEET OF LAND SURFACE. THE RUNOFF AND EROSION FROM INDIVIDUAL SITES IS THEN MEASURED AND COMPARED.

TYPE OF STUDY:

PART OF 'PUBLIC LANDS HYDROLOGY PROGRAM,' U.S. GEOLOGICAL SURVEY IN COOPERATION WITH 'ENERGY MINERALS REHABILITATION INVENTORY AND ANALYSIS-EMRIA' U.S. BUREAU OF LAND MANAGEMENT.

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00000338

PROJECT TITLE:

YELLOWSTONE RIVER BASIN AND ADJACENT COAL AREA LEVEL 'B'

INVESTIGATORS:

KEITH H. CORRIGALL
MISSOURI RIVER BASIN COMMISSION
32 S. EWING
HELENA, MT 59601
PAUL H. SHORE
MISSOURI RIVER BASIN COMMISSION
NORTHFORK STAR ROUTE
CODY, WY 82414
DON OHNSTAD
MISSOURI RIVER BASIN COMMISSION
501 E. BISMARCK AVE. - ROOM 16
BISMARCK, ND 58501

PROJECT SUPERVISOR:

ROBERT H. MADSEN
MISSOURI RIVER BASIN COMMISSION
TRANSWESTERN LIFE BLDG., ROOM 332, 404 N. 31ST ST.
BILLINGS, MT 59101

COORDINATOR:

MISSOURI RIVER BASIN COMMISSION
NICHOLAS L. BARBAROSSA
10050 REGENCY CIRCLE, SUITE 403
OMAHA, NE 58114

PRIMARY SPONSOR:

U.S. WATER RESOURCES COUNCIL
SUITE 800, 2120 L ST. NW
WASHINGTON, DC 20037

PRIMARY FUNDING AMOUNT:

1,115,000

SECONDARY FUNDING AMOUNT:

1,290,000

TIME FRAME:

02 01 76 TO 07 31 77

LOCATION:

MT ND WY - PORTIONS INCLUDED IN THE YELLOWSTONE RIVER DRAINAGE AND TRIBUTARIES DRAINING TO THE MISSOURI RIVER FROM THE WEST IN NORTH DAKOTA PLUS THE COUNTIES OF MUSSELSHELL, GARFIELD, MCCONE & RICHLAND IN MONTANA, MCLEAN IN NORTH DAKOTA AND CROOK, WESTON, NIOBRARA, CONVERSE AND NATRONA IN WYOMING, ALL OF WHICH FALL OUTSIDE THE YELLOWSTONE OR WESTERN MISSOURI TRIBUTARIES BASINS

ABSTRACT:

THE YELLOWSTONE RIVER BASIN AND ADJACENT COAL AREA STUDY IS A RECONNAISSANCE INVESTIGATION TO PROVIDE A MULTIAGENCY INTERDISCIPLINARY WATER AND RELATED LANDS STUDY TO PROJECT AND EVALUATE ALTERNATIVE FUTURE DEVELOPMENTS BASED UPON THE PRINCIPLES AND STANDARDS FOR WATER RESOURCE DEVELOPMENT DEVELOPED BY THE WATER RESOURCE COUNCIL. THE STUDY WILL CONCENTRATE ON THE CONFLICTS AND TRADEOFFS BETWEEN DEPLETIVE WATER USES SUCH AS ENERGY AND IRRIGATED AGRICULTURE AND NON-DEPLETIVE USES SUCH AS INSTREAM FLOW, IMPROVED MANAGEMENT, WATER QUALITY ENHANCEMENT, RECREATION, ETC.

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00000339

PROJECT TITLE:

WATER QUALITY AND AQUATIC ECOSYSTEM STUDIES AT BIG HORN MINE - SHERIDAN, WYOMING

INVESTIGATORS:

RICHARD D. OLSEN ; WILLIAM S. VINIKOUR

PROJECT SUPERVISOR:

R. CARTER ; R. CAMERON
U.S. ERDA, ARGONNE NATIONAL LAB., ENERGY & ENV. SYSTEMS DIV.
9700 S. CASS AVE.
ARGONNE, IL 60439

COORDINATOR:

LAND RECLAMATION PROGRAM
R. CARTER R. CAMERON
U.S. ERDA, ARGONNE NATIONAL LAB.
9700 S. CASS AVE.
ARGONNE, IL 60439

PRIMARY SPONSOR:

U.S. ERDA, DIV. OF BIOMEDICAL & ENV. RESEARCH
RALPH E. FRANKLIN
WASHINGTON, D.C. 20545

PRIMARY FUNDING AMOUNT:

100,000

TIME FRAME:

07 01 75 TO CONTINUING

1.3 WATER RESOURCES

LOCATION:
WY - SHERIDAN CO.
ABSTRACT:

PRELIMINARY AQUATIC STUDIES WERE CONDUCTED ON THE TONGUE RIVER AND TRIBUTARIES IN THE VICINITY OF THE BIG HORN MINE, SHERIDAN CO., DURING THE SUMMER AND FALL OF 1975. THESE STUDIES ESSENTIALLY CONSISTED OF MEASUREMENT OF PERTINENT WATER QUALITY PARAMETERS (IN MINE EFFLUENTS AND STREAMS) AND BIOTIC POPULATIONS AT IMPORTANT TROPHIC LEVELS. THE BASIC OBJECTIVES OF THE PRELIMINARY STUDY (AS WELL AS ANTICIPATED LONG-TERM STUDIES) ARE: 1) DETERMINE THE PHYSICAL, CHEMICAL, AND HYDROLOGIC STRESSES ON THE AQUATIC SYSTEMS; 2)DETERMINE STRUCTURAL AND FUNCTIONAL RELATIONSHIPS IN STRESSED AND UNSTRESSED PARTS OF THE AQUATIC SYSTEM; 3) RELATE BIOTIC IMPACTS TO PHYSICAL AND CHEMICAL EFFECTS OF COAL EXTRACTION.

PART OF ´LAND RECLAMATION PROGRAM,´ U.S. ERDA, ARGONNE NATIONAL LAB.

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00000340
PROJECT TITLE:
RANGE LAND RESOURCE RESEARCH
INVESTIGATORS:
FRANK MUNSHOWER
PROJECT SUPERVISOR:
RICHARD HODDER
MONTANA STATE UNIV., AG. EXP. STATION
BOZEMAN, MT 59715
COOPERATOR:
PUGET SOUND POWER & LIGHT
PRIMARY SPONSOR:
MONTANA POWER CO.
40 E. BROADWAY
BUTTE, MT 59701
PRIMARY FUNDING AMOUNT:
PROPRIETARY
TIME FRAME:
01 01 72 TO CONTINUING
LOCATION:
MT
ABSTRACT:
THE MONTANA AGRICULTURAL EXPERIMENT STATION HAS BEEN COLLECTING PHYSICAL AND CHEMICAL INFORMATION ON SOILS, ANIMALS AND RANGE VEGETATION SINCE 1972. MAJOR PLANT COMMUNITIES HAVE BEEN ISOLATED WITH ENCLOSURES SO AS TO MONITOR FUTURE CHANGES RELATIVE TO STACK EMISSIONS. CHEMICAL ELEMENTS BEING STUDIED IN SOILS, VEGETATION AND SMALL MAMMALS WERE SELECTED ACCORDING TO AVAILABILITY IN ROSEBUD COAL AND TOXICITY TO PLANTS AND ANIMALS.
REPORTS AND PUBLICATIONS:
ANNUAL REPORT FOR EACH YEAR BEGINNING IN 1972 FILED WITH THE DEPARTMENT OF NATURAL RESOURCES AND ALSO IN THE MONTANA AGRICULTURAL EXPERIMENT STATION LIBRARY AT MONTANA STATE UNIVERSITY.

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00000341
PROJECT TITLE:
THE IMPACT OF THE FUEL CONVERSION PROCESS ON NATIVE VEGETATION IN THE VICINITY OF COLSTRIP, MONTANA.
INVESTIGATORS:
RICHARD L. HODDER
PROJECT SUPERVISOR:
FRANK F. MUNSHOWER
MONTANA STATE UNIV., DEPT. OF ANIMAL & RANGE SCIENCE
BOZEMAN, MT 59715
COOPERATOR:
UNIV. OF MONTANA
U.S. ERDA, AMES LAB.
U.S. ERDA, BATTELLE PACIFIC NW LAB.
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
39,000
TIME FRAME:
06 01 75 TO 05 30 76
LOCATION:
MT
ABSTRACT:
THE IMPACT OF THE COLSTRIP OPERATION ON SAMPLING PLOTS OF GRASS, SHRUB, AND FOREST VEGETATION WILL BE ASSESSED. PLANT COMMUNITY CHARACTERISTICS, (E.G. CANOPY COVER, SPECIES DIVERSITY, GROWTH AND PRODUCTIVITY, AND PHENOLOGY) WILL BE EVALUATED. COORDINATION OF THIS STUDY AND THE RANGE RESOURCE EVALUATION SPONSORED BY THE MONTANA POWER COMPANY WILL PROVIDE AN ASSESSMENT OF THE IMPACT OF COLSTRIP UNITS I AND II UPON THE NATIVE RANGE AND FOREST RESOURCE.

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00000342
PROJECT TITLE:
TRACE ELEMENT ANALYSES OF COLSTRIP COAL
INVESTIGATORS:
R. A. WOODRIFF
MONTANA STATE UNIV., CHEMISTRY DEPT.
PROJECT SUPERVISOR:
ROBERT A. CHADWICK
MONTANA STATE UNIV., EARTH SCIENCES DEPT.
BOZEMAN, MT 59715
PRIMARY SPONSOR:
MONTANA POWER CO.
40 E. BROADWAY
BUTTE, MT 59701
PRIMARY FUNDING AMOUNT:
8,500
TIME FRAME:
04 01 73 TO 04 01 75
STATUS:
COMPLETED 04 01 75
LOCATION:
MT
ABSTRACT:
CONCENTRATIONS OF SULFUR AND TRACE ELEMENTS IN THE ROSEBUD AND MCKAY COAL SEAMS FROM WESTERN ENERGY CO. CONTROLLED PROPERTIES IN THE COLSTRIP FIELD HAVE BEEN DETERMINED AND THEIR DISTRIBUTION PLOTTED. TRACE ELEMENTS WERE

ANALYZED BY FURNACE ATOMIC ABSORPTION SPECTROSCOPY (EXCEPT FOR FLUORINE). ELEMENTS RUN WERE: ANTIMONY, ARSENIC, BORON, BERYLLIUM, CADMIUM, CHROMIUM, COPPER, FLUORINE, GERMANIUM, LEAD, MANGANESE, MERCURY, NICKEL, SELENIUM, AND ZINC.

TRACE ELEMENTS WERE DETERMINED FROM AIR DRIED, PULVERIZED COAL SAMPLES REPRESENTING CORES FROM 49 DRILL HOLES PENETRATING THE ROSEBUD SEAM AND 26 IN THE MCKAY. IN SEVERAL HOLES, VERTICAL INCREMENTS OF 5 FEET WERE RUN SEPARATELY. SULFUR DATA WERE TAKEN FROM ANALYSES BY OUTSIDE LABORATORIES. THE ELEMENTS ANTIMONY, ARSENIC, BERYLLIUM, CADMIUM, MERCURY, NICKEL, SELENIUM, AND SULFUR ARE MARKEDLY ENRICHED IN THE BASAL FOOT OR FEW FEET OF THE COAL SEAMS. THESE ENRICHMENTS APPEAR RELATED TO VISIBLE CONCENTRATIONS OF PYRITE IN THESE PORTIONS OF THE SEAMS. LATERAL VARIATIONS OF TRACE ELEMENTS ARE LESS NOTABLE THAN VERTICAL VARIATIONS.

THE STUDY CONTRIBUTES TO AN EVALUATION OF POSSIBLE AIR POLLUTION HAZARDS WHEN MINE-SITE POWER PLANTS BEGIN OPERATION.

REPORTS AND PUBLICATIONS:

CHADWICK, R. A. ET AL. 'SULFUR AND TRACE ELEMENTS IN THE ROSEBUD AND MCKAY COAL SEAMS, COLSTRIP FIELD, MONTANA' MONTANA GEOLOGICAL SOC. ENERGY RESOURCES OF MONTANA, 22ND ANN. PUBL., P. 167-176. 1975.

CHADWICK, R. A., WOODRIFF, R. A. ET AL. 'LATERAL AND VERTICAL VARIATIONS IN SULFUR AND TRACE ELEMENTS IN COAL- COLSTRIP FIELD, MONTANA' MONT. ACAD. SCI., PROD. FT. UNION COAL SYMPOS., V. 3, P. 362-373. 1975.

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00000343

PROJECT TITLE:

DEVELOPMENT OF RESOURCE DATA ON LANDS LIKELY TO BE AFFECTED BY HUMAN POPULATION CHANGES RELATED TO MINING AND POWER GENERATION DEVELOPMENT IN SOUTHEASTERN MONTANA

INVESTIGATORS:

JOHN E. TAYLOR, MONTANA STATE UNIV.
A. SILVERMAN, UNIV. OF MONTANA
JOHN MCBRIDE, UNIV. OF MONTANA

PROJECT SUPERVISOR:

GENE F. PAYNE
MONTANA STATE UNIV., DEPT. OF ANIMAL & RANGE SCIENCES
BOZEMAN, MT 59715

PRIMARY SPONSOR:

NATIONAL SCIENCE FOUNDATION, RANN

PRIMARY FUNDING AMOUNT:

40,032

TIME FRAME:

05 01 75 TO 05 01 76

LOCATION:

MT

ABSTRACT:

THE OBJECTIVES OF THIS RESEARCH ARE:

1. TO ESTABLISH AS A BASE FOR FUTURE REFERENCE THE STATUS OF ECOSYSTEMS IN SOUTHEASTERN MONTANA MOST LIKELY TO BE INFLUENCED BY THE DEVELOPMENT OF INTENSIVE AND EXTENSIVE URBAN DEVELOPMENT AND RECREATIONAL USES.
2. TO ESTABLISH THE CHARACTERISTICS OF SMALL WATERSHEDS IN AREAS LIKELY TO BE AFFECTED BY THE DEVELOPMENT OF URBAN HOUSING AND RECREATIONAL USES.
3. TO ESTABLISH CLASSIFICATION AND EVALUATION SYSTEMS FOR MAJOR ECOSYSTEM COMPONENTS WHICH CAN BE USED BY COUNTY AND STATE AGENCIES IN DEVELOPING BASE DATA FOR PLANNING AND MANAGEMENT.

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00000344

PROJECT TITLE:

THE POTENTIAL IMPACT OF COAL STRIP MINING ON THE WILDLIFE RESOURCES OF SARPY CREEK DRAINAGE, MT

INVESTIGATORS:

HAROLD PICTON; ROBERT MOORE; ROBERT ENG

PROJECT SUPERVISOR:

RICHARD W. GREGORY
MONTANA STATE UNIV., BIOLOGY DEPT.
BOZEMAN, MT 59715

COOPERATOR:

MONTANA DEPT. OF FISH AND GAME
WESTMORELAND RESOURCES
MONTANA DEPT. OF HEALTH & ENVIRONMENTAL SCIENCES
U.S. FISH & WILDLIFE SERV.

PRIMARY SPONSOR:

AMAX COAL CO.

PRIMARY FUNDING AMOUNT:

50,340

TIME FRAME:

03 15 75 TO 03 15 76

LOCATION:

MT

ABSTRACT:

MAJOR OBJECTIVES ONLY. BIRD SEGMENT: 1. DETERMINE SPECIES COMPOSITION OF BIRDS BY VEGETATIONAL TYPE. 2. MEASURE DENSITY OF BIRDS ON PRINCIPAL VEGETATIONAL TYPE. 3. ESTIMATE POPULATION AND DISTRIBUTION OF MAJOR GAME BIRD SPECIES. LARGE MAMMAL SEGMENT: 1. MAP AND CLASSIFY VEGETATION IN STUDY AREA. 2. DETERMINE LARGE MAMMAL SPECIES, POPULATION SIZE AND TYPE, LOCATION, AND SEASON OF USE OF AREA VEGETATIONAL TYPES. 3. ESTIMATE CURRENT AND POTENTIAL WILDLIFE USE BY HUMANS IN THE AREA. 4. ESTIMATE EFFECTS OF LARGE MAMMAL SPECIES ON ATTEMPTS TO RE-VEGETATE MINED LANDS.

SMALL MAMMAL SEGMENT: 1. DETERMINE SPECIES COMPOSITION

OF SMALL MAMMALS BY VEGETATION TYPES. 2. ESTIMATE POPULATION SIZES OF SMALL MAMMALS IN PRINCIPAL VEGETATION TYPES. FISH SEGMENT: 1. MAP STREAM MORPHOMETRY OF SARPY CREEK. 2. DETERMINE SPECIES COMPOSITION, STANDING CROP AND DISTRIBUTION OF FISHES. 3. ESTIMATE USE PATTERNS OF FISHES MIGRATING FROM THE YELLOWSTONE.
4. QUALIFY OCCURRENCE AND DISTRIBUTION OF STREAM BENTHOS.
5. ESTIMATE FISHERMEN USE OF AREA.
ALL SEGMENTS: TO PREDICT EFFECTS OF COAL STRIP MINING ON ALL OF THE ABOVE.

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00000345
PROJECT TITLE:
DEVELOPMENT OF A DIFFUSION MODEL TO PREDICT THE AIR POLLUTION POTENTIAL OF ELEVATED CONTINUOUS SOURCES AT COLSTRIP, MONTANA
INVESTIGATORS:
A. B. SUPER; JACK MCPARTLAND
PROJECT SUPERVISOR:
JAMES A. HEIMBACH, JR
MONTANA STATE UNIV., EARTH SCIENCE DEPT.
BOZEMAN, MT
PRIMARY SPONSOR:
MONTANA POWER CO.
PRIMARY FUNDING AMOUNT:
140,755.16
TIME FRAME:
07 01 73 TO 06 30 75
STATUS:
COMPLETED 06 30 75
LOCATION:
MT
ABSTRACT:

A DIFFUSION EXPERIMENT WAS CONDUCTED AT COLSTRIP, MONTANA, TO ESTIMATE THE EFFECTS OF THE SEMI-RUGGED TERRAIN ON THE DISPERSION OF A PLUME FROM A LARGE ELEVATED SOURCE. THE TRACING TECHNIQUES INVOLVED THE CONTINUOUS RELEASE OF SILVER IODIDE FROM AN EFFECTIVE HEIGHT OF 500 FEET ABOVE THE GENERAL TERRAIN AND ITS SUBSEQUENT TRACKING USING AIRBORNE AND GROUND-BASED NCAR ACOUSTICAL ICE NUCLEUS COUNTERS.

THE RESULTS SHOW THAT THE ADDITIONAL MECHANICAL TURBULENCE INDUCED BY THE TERRAIN PLAYS A SIGNIFICANT ROLE IN THE DISPERSION OF CONTAMINANTS. THE HORIZONTAL DIFFUSION WAS LARGER THAN PREDICTED BY TURNER'S AND BOWNE'S MODELS AT ALL DOWNWIND DISTANCES. THE VERTICAL DIFFUSION OVER COLSTRIP COMPARED FAVORABLY TO BOWNE'S SUBURBAN PARAMETERIZATION AND VERIFIED HIS REASONING THAT THE VERTICAL DISPERSION APPROACHES A LIMIT FOR LARGE DOWNWIND DISTANCES. IT WAS FOUND THAT THE HORIZONTAL AND VERTICAL DIFFUSION RATES WERE NOT WELL CORRELATED. FOR THIS REASON A DUAL MODEL IS RECOMMENDED FOR THE AREA WHICH USES WIND SPEED AND LAPSE RATE FOR PREDICTING VERTICAL DIFFUSION, AND WIND SPEED AND DIRECTION RANGE FOR THE HORIZONTAL.

REPORTS AND PUBLICATIONS:
COLSTRIP DIFFUSION EXPERIMENT - FINAL REPORT

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00000346
PROJECT TITLE:
DIFFUSION MODELING
PROJECT SUPERVISOR:
ARLAN B. SUPER
108 MONTANA HALL
BOZEMAN, MONTANA 59715
COOPERATOR:
PUGET SOUND POWER AND LIGHT
PRIMARY SPONSOR:
MONTANA POWER CO.
40 E. BROADWAY
BUTTE, MT 59701
PRIMARY FUNDING AMOUNT:
PROPRIETARY
TIME FRAME:
09 01 72 TO 07 01 74
STATUS:
COMPLETED 07 01 74
LOCATION:
MT
ABSTRACT:

DEVELOPMENT OF A DIFFUSION MODEL FOR PREDICTING AIR POLLUTION POTENTIAL UNDER A RANGE OF WEATHER CONDITIONS. THIS STUDY WILL HELP DETERMINE STACK HEIGHTS FOR THE COLSTRIP GENERATING FACILITY.

REPORTS AND PUBLICATIONS:
DIFFUSION MODEL TO PREDICT POLLUTION AT COLSTRIP MODEL - FILED WITH THE DEPARTMENT OF NATURAL RESOURCES, THE DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES, AIR QUALITY BUREAU, AND THE MONTANA STATE UNIVERSITY LIBRARY.

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00000347
PROJECT TITLE:
USE OF LICHENS AS INDICATORS AND PREDICTORS OF AIR POLLUTION AROUND A COAL-FIRED POWER PLANT
PROJECT SUPERVISOR:
SHARON EVERSMAN
MONTANA STATE UNIV., BIOLOGY DEPT.

BOZEMAN, MT 59715

PRIMARY SPONSOR:

U.S. EPA, CORVALLIS NAT. ENV. RESEARCH CENTER
CORVALLIS, OR 97330

PRIMARY FUNDING AMOUNT:

24,159

TIME FRAME:

07 22 74 TO 07 21 76

LOCATION:

MT

ABSTRACT:

TWO LICHEN SPECIES, PARMELIA CHLOROCHROA AND USNEA HIRTA, ARE BEING COLLECTED FROM THE AREA IN SOUTHEAST MONTANA EXPECTED TO BE AFFECTED BY THE EMISSIONS FROM THE COLSTRIP 1 AND 2 POWER PLANTS. CHLOROPHYLL ANALYSES, THALLUS WEIGHTS, RESPIRATION RATES, TOTAL NITROGEN AND SULFUR CONTENTS ARE BEING DETERMINED FOR EACH SAMPLE. THIS BASELINE DATA WILL BE COMPARED WITH DATA OBTAINED FROM LICHENS EXPOSED TO THE EMISSIONS FROM THE POWER PLANT, AND WITH THOSE OBTAINED FROM LICHEN SAMPLES EXPOSED TO VARIOUS MONITORED AMOUNTS OF SO2 ON A GRASSLAND TEST PLOT IN CUSTER NATIONAL FOREST. OTHER FIELD ACTIVITIES INCLUDE DETERMINATION AND MAPPING OF TERRICOLOUS AND CORTICOLOUS LICHEN COMMUNITIES.

REPORTS AND PUBLICATIONS:

NERL, EPA, DECEMBER, 1974. THE BIOENVIRONMENTAL IMPACT OF A COAL-FIRED POWER PLANT, FIRST INTERIM REPORT, COLSTRIP, MONTANA. SECOND INTERIM REPORT IS IN PRESS.

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00000348

PROJECT TITLE:

AIR POLLUTION POTENTIAL AND BASELINE AIR QUALITY FOR AMAX COAL DEVELOPMENT IN MONTANA

INVESTIGATORS:

KEN EMERSON

PROJECT SUPERVISOR:

JAMES A. HEIMBACH, JR.
MONTANA STATE UNIV., EARTH SCIENCE DEPT.
BOZEMAN, MT 59715

PRIMARY SPONSOR:

AMAX COAL CO.

PRIMARY FUNDING AMOUNT:

29,745

TIME FRAME:

03 01 75 TO 11 01 76

LOCATION:

MT

ABSTRACT:

AMAX COAL COMPANY IS PLANNING TO OPEN A STRIP MINE IN TREASURE AND BIG HORN COUNTIES, MONTANA. IN ORDER THAT THIS FACILITY MAY COMPLY WITH STATE AND FEDERAL AIR POLLUTION REGULATIONS, INFORMATION ON THE PERTINENT METEOROLOGICAL FACTORS TO AIR POLLUTION POTENTIAL AS WELL AS BASELINE AIR QUALITY DATA ARE NEEDED IN THE INITIAL STAGES AND AS THE VENTURE EXPANDS.

MONTANA STATE UNIVERSITY (MSU) RECOGNIZES THAT THE PROPOSED MINING VENTURE, WITH PROPER FORESIGHT, IS OF BENEFIT TO THE DEVELOPMENT OF THE STATE OF MONTANA. MSU HAS THE ABILITY AND DESIRE TO AID AMAX IN THE INVESTIGATION OF THE METEOROLOGICAL AND BASELINE ASPECTS OF AIR POLLUTION THROUGH THE STAFF OF THE CHEMISTRY AND EARTH SCIENCES DEPARTMENTS. THEREFORE, MSU PROPOSES AN APPLIED RESEARCH PROGRAM WITH THE FOLLOWING OBJECTIVES:

1. MONITOR FOR A ONE-YEAR PERIOD THE METEOROLOGICAL FACTORS WHICH ARE IMPORTANT IN THE EVALUATION OF AIR POLLUTION POTENTIAL FROM GROUND-BASED SOURCES.
2. MONITOR FOR A ONE-YEAR PERIOD THE BASELINE AIR QUALITY INFORMATION PERTINENT TO STRIP MINING.
3. DERIVE THE WIND, PRECIPITATION, HUMIDITY, TEMPERATURE AND STABILITY CLIMATOLOGY FOR THE ONE YEAR OF DATA AND BASED ON THESE, DESCRIBE THE AIR POLLUTION POTENTIAL FOR THE AREA.
4. SUMMARIZE THE BASELINE AIR QUALITY DATA IN AN EASILY USABLE FORMAT AND RELATE TO CONCURRENT METEOROLOGICAL PARAMETERS OF OBJECTIVE 1.

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00000349

PROJECT TITLE:

ENVIRONMENTAL IMPACT STATEMENTS FOR: 1. TOTAL AREA UNDER LEASE BY WESTMORELAND RESOURCES ON THE CROW CEDED AREA; AND 2. MINING PLAN FOR EXTENSION OF PRESENT WESTMORELAND RESOURCES MINE.

INVESTIGATORS:

ARNE M. DEGN; MARION T. HEDEGAARD

PROJECT SUPERVISOR:

WAYNE E. STEPHENS
U.S. BUREAU OF INDIAN AFFAIRS, PLANNING SUPPORT GROUP
316 NO. 26TH ST. - FED. BLDG.
BILLINGS, MT 59101

PRIMARY SPONSOR:

U.S. DEPT. OF INTERIOR

PRIMARY FUNDING AMOUNT:

APPROXIMATELY 300,000

TIME FRAME:

12 01 75 TO 10 01 75

LOCATION:

MT - CROW INDIAN RESERVATION AND CEDED AREA

ABSTRACT:

WESTMORELAND RESOURCES IS PLANNING AN EXPANSION OF THEIR MINING OPERATION OF CROW INDIAN COAL. HOWEVER, ACCORDING

TO AN OPINION FROM THE APPEALS COURT IN CODY VS. MORTON, A LEASEWIDE ANALYSIS OF THE IMPACTS OF FULL DEVELOPMENT OF THE WHOLE LEASE AREA MUST BE COMPLETED BEFORE ANY FURTHER MINING CAN BE CONSIDERED. THIS OPINION HAS THEREFORE REQUIRED THE PREPARATION OF THE TWO STATEMENTS LISTED IN NO. 2 ABOVE.

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00000350
PROJECT TITLE:
PILOT SCRUBBER RESEARCH FOR COLSTRIP FACILITY
PROJECT SUPERVISOR:
R. J. LABRIE
MONTANA POWER CO.
BUTTE, MT 59701
COOPERATOR:
COMBUSTION EQUIPMENT ASSOCIATES
BECHTEL CORP.
PRIMARY SPONSOR:
MONTANA POWER CO.
PRIMARY FUNDING AMOUNT:
PROPRIETARY
TIME FRAME:
01 01 73 TO 12 31 74
STATUS:
COMPLETED 12 31 74
LOCATION:
MT
ABSTRACT:
THE OBJECTIVE OF THIS PROGRAM WAS TO DEVELOP AN EFFECTIVE VENTURI SCRUBBER TO REMOVE SO2 AND PARTICULATES IN BOILER GENERATED FLU GAS FROM COLSTRIP COAL.

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00000351
PROJECT TITLE:
SYSTEMS EVALUATION OF THE USE OF LOW SULFUR WESTERN COAL IN SMALL AND INTERMEDIATE SIZE BOILERS
PROJECT NUMBER:
68-02-1863
INVESTIGATORS:
KENNETH L. MALONEY
PROJECT SUPERVISOR:
DONALD BARTZ
KVB, INC.
17332 IRVINE BLVD.
TUSTIN, CA 92680
PRIMARY SPONSOR:
U.S. EPA
DAVID G. LACHAPELLE
INDUSTRIAL ENVIRONMENTAL RESEARCH LAB.
RESEARCH TRIANGLE PARK, NC 27711
PRIMARY FUNDING AMOUNT:
675,400
TIME FRAME:
02 13 75 TO 02 13 77
LOCATION:
CA MN WI
ABSTRACT:
THIS EPA PROJECT IS AIMED AT DEMONSTRATING THE ENVIRONMENTALLY SOUND USE IN THE COMBUSTION PROCESS FOR WESTERN BITUMINOUS COAL. THIS STUDY WILL HAVE BENEFICIAL IMPACT IN AT LEAST TWO WAYS: 1. BY DEMONSTRATING THE VIABILITY OF THIS SYSTEM IT CAN ENCOURAGE INCREASED UTILTZATION OF WESTERN COAL RESERVES; 2. THE TYPE OF SYSTEM BEING EVALUATED (BOILERS) CONSTITUTES A MAJOR AREA SOURCE OF SULFUR DIOXIDE POLLUTION. USE OF LOW SULFUR WESTERN COAL CAN BRING ABOUT A MARKED REDUCTION IN SULFUR POLLUTION. THE EPA IS CONSIDERING BOTH THE EMISSION ASPECT AND UNIT PERFORMANCE ASPECT OF CONVERTING COMBUSTION SYSTEMS FOR USE WITH WESTERN COAL. THE EPA WILL PROVIDE APPROPRIATE GUIDELINES AND WILL EVALUATE THE COST-EFFECTIVENESS OF UTILIZING WESTERN COAL TO THE MAXIMUM EXTENT, CONSIDERING ENVIRONMENTAL IMPACT, ENGINEERING VIABILITY AND ECONOMICS.

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00000352
PROJECT TITLE:
REMOVAL OF FLY ASH FROM STACK GASES BY ELECTROSTATIC PRECIPITATION
PROJECT NUMBER:
BA-06-03
PROJECT SUPERVISOR:
E. A. SONDREAL
U.S. ERDA, GRAND FORKS ENERGY RESEARCH CENTER
BOX 8213, UNIV. STATION
GRAND FORKS, ND 58202
PRIMARY SPONSOR:
U.S. ERDA
WASHINGTON, DC 20545
PRIMARY FUNDING AMOUNT:
FY 76 - 200,000
TIME FRAME:
07 01 67 TO 06 30 78
LOCATION:
ND
ABSTRACT:
OBJECTIVES: THE MAJOR OBJECTIVES ARE TO DEVELOP RELIABLE METHODS FOR EVALUATION OF THE COLLECTABILITY OF HIGH-

RESISTIVITY FLY ASH FORMED BY COMBUSTION OF LOW-SULFUR-CONTENT WESTERN COALS BY ELECTROSTATIC PRECIPITATION, TO DEVELOP A DESIGN BASIS FOR SIZING OF ELECTROSTATIC PRECIPITATORS BASED ON LABORATORY TESTING PROCEDURES THAT CAN BE PERFORMED ON REASONABLY SMALL SAMPLES, AND TO DEVELOP NEW MATERIALS AND METHODS TO CONDITION FLY ASH TO IMPROVE COLLECTION EFFICIENCY.

REPORTS AND PUBLICATIONS:

1. S. J. SELLE, P. H. TUFTE, ET AL. ´A STUDY OF THE ELECTRICAL RESISTIVITY OF FLY ASHES FROM LOW-SULFUR WESTERN COALS USING VARIOUS METHODS.´ PRESENTED BY AIR POLLUTION CONTROL ASSOCIATION 65TH ANNUAL MEETING PREPRINT NO. 7 (2) 107, JUNE 1972, 21 PP.
2. SELLE, STANLEY J., LINDSAY L. HESS, AND EVERETT A. SONDREAL. ´WESTERN FLY ASH COMPOSITION AS AN INDICATOR OF RESISTIVITY AND PILOT ESP REMOVAL EFFICIENCY.´ PRESENTED AT THE 68TH ANNUAL AIR POLLUTION CONTROL ASSOCIATION MEETING, JUNE 1975. PREPRINTS OF BOTH PAPERS AVAILABLE FROM AUTHORS, AT GRAND FORKS ENERGY RESEARCH CENTER.

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00000353

PROJECT TITLE:
WILDLIFE & WILDLIFE HABITAT BASELINE AND MONITORING, TRACT III

INVESTIGATORS:
43-23-A

PROJECT SUPERVISOR:
ROBERT E. CARROLL
ECOLOGICAL CONSULTING SERVICE
1300 BLOCK CEDAR ST.
HELENA, MT 59601

PRIMARY SPONSOR:
WESTMORELAND RESOURCES
DAVID SIMPSON
BOX 449
HARDIN, MT

PRIMARY FUNDING AMOUNT:
PROPRIETARY

TIME FRAME:
06 30 73 TO CONTINUING

LOCATION:
MT - BIG HORN COUNTY - SARPY CREEK

ABSTRACT:
TO OBTAIN 4-SEASON BASELINE OF WILDLIFE AND WILDLIFE HABITAT ON TRACT III AND MONITORING WILDLIFE & HABITAT PARAMETERS ANNUALLY.

REPORTS AND PUBLICATIONS:
ANNUAL REPORT (´73, ´74, ´75) TO WESTMORELAND RESOURCES. FILED WITH DEPT. STATE LANDS

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00000354

PROJECT TITLE:
WILDLIFE & WILDLIFE HABITAT BASELINE AND MONITORING OF BIG SKY MINE

PROJECT NUMBER:
55-23-A

PROJECT SUPERVISOR:
ROBERT E. CARROLL
ECOLOGICAL CONSULTING SERVICE
1300 BLOCK CEDAR ST.
HELENA, MT 59601

PRIMARY SPONSOR:
PEABODY COAL CO.
JACK BECKNER
301 NORTH MEMORIAL DR.
ST. LOUIS, MISSOURI

PRIMARY FUNDING AMOUNT:
PROPRIETARY

TIME FRAME:
06 30 73 TO CONTINUING

LOCATION:
MT - BIG SKY MINE, ROSEBUD COUNTY

ABSTRACT:
TO OBTAIN 4-SEASON BASELINE OF WILDLIFE & WILDLIFE HABITAT AT BIG SKY MINE AND MONITORING WILDLIFE AND HABITAT PARAMETERS ANNUALLY.

REPORTS AND PUBLICATIONS:
ANNUAL REPORT (´73, ´74, ´75) TO PEABODY COAL CO. FILED WITH DEPT. STATE LANDS

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00000355

PROJECT TITLE:

IMPACT OF COLSTRIP UNITS 3 AND 4 ON PUBLIC SERVICE REQUIREMENTS

INVESTIGATORS:

DONALD W. PATTERSON

PROJECT SUPERVISOR:

ANNE S. WILLIAMS
MONTANA STATE UNIV., INST. OF APPLIED RESEARCH
BOZEMAN, MT 59715

PRIMARY SPONSOR:

MONTANA DEPT. OF SOCIAL & REHABILITATION SERVICES

PRIMARY FUNDING AMOUNT:

23,000

TIME FRAME:

09 01 73 TO 08 31 74

STATUS:

COMPLETED 08 31 74

LOCATION:

MT

ABSTRACT:

OBJECTIVES OF THE STUDY WERE TO: 1. IDENTIFY THE PUBLIC SERVICE NEEDS WHICH WOULD ACCOMPANY CONSTRUCTION OF COLSTRIP GENERATORS NO. 3 AND NO. 4. 2. IDENTIFY THE DISPARITIES (IF ANY) BETWEEN PROJECTED LEVELS OF POPULATION GROWTH AND THE AVAILABILITY OF PUBLIC SERVICES; 3. MAKE POLICY RECOMMENDATIONS TO CORRECT IDENTIFIED PUBLIC SERVICE DELIVERY PROBLEMS.

STUDY AREA INCLUDED ROSEBUD COUNTY, MONTANA AND NEARBY SERVICE CENTERS.

CONCLUSION WAS THAT EXISTING AND PLANNED PUBLIC SERVICES COULD NOT ADEQUATELY SERVE PROJECTED LEVEL OF POPULATION GROWTH THAT WOULD ACCOMPANY CONSTRUCTION OF THE PROPOSED GENERATORS, AND THAT THE MOST DIFFICULT TIMES WOULD OCCUR DURING PEAK CONSTRUCTION YEARS.

REPORTS AND PUBLICATIONS:

INSTITUTE OF APPLIED RES., MONTANA STATE UNIVERSITY. ´ANTICIPATED IMPACT OF COLSTRIP GENERATORS NO. 3 AND NO. 4 ON PUBLIC SERVICES´. BOZEMAN, JULY 1974. AVAILABLE FROM MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION, HELENA, MT.

*****

00000356

PROJECT TITLE:

IMPACT OF COAL DEVELOPMENT ON PUBLIC SERVICES IN THE NORTHERN PLAINS STATES

PROJECT SUPERVISOR:

ANNE S. WILLIAMS
MONTANA STATE UNIV., INST. OF APPLIED RESEARCH
BOZEMAN, MT 59715

COOPERATOR:

MONTANA STATE UNIV., AG. EXP. STATION

PRIMARY SPONSOR:

NORTHERN GREAT PLAINS RESOURCES PROGRAM

PRIMARY FUNDING AMOUNT:

9,500

TIME FRAME:

09 01 73 TO 08 31 74

STATUS:

COMPLETED 08 31 74

LOCATION:

MT ND WY

ABSTRACT:

STUDY AREA INCLUDED BIG HORN AND ROSEBUD COUNTIES IN MONTANA, MERCER AND OLIVER COUNTIES IN NORTH DAKOTA, AND SHERIDAN AND CAMPBELL COUNTIES IN WYOMING. OBJECTIVES WERE: 1. TO IDENTIFY THE PUBLIC SERVICE NEEDS WHICH WOULD ACCOMPANY THREE LEVELS OF PROJECTED COAL DEVELOPMENT IN THE THREE NORTHERN PLAINS STATES, 2. TO DETERMINE THE SOURCES AND AMOUNT OF TAX REVENUE LIKELY TO BE GENERATED UNDER THE THREE COAL DEVELOPMENT SCENARIOS, 3. TO IDENTIFY THE DISPARITIES (IF ANY) BETWEEN PUBLIC SERVICE NEEDS AND AVAILABILITY OF REVENUE TO PAY FOR THEM, AND 4. TO MAKE POLICY RECOMMENDATIONS TO CORRECT IDENTIFIED PUBLIC SERVICE DELIVERY PROBLEMS.

MAJOR POLICY RELEVANT CONCLUSIONS WERE: 1. EXISTING PUBLIC SERVICES IN NONE OF THE SIX COUNTIES STUDIED COULD ADEQUATELY ACCOMMODATE THE LEVEL OF POPULATION GROWTH ANTICIPATED UNDER ANY OF THE THREE COAL DEVELOPMENT SCENARIOS; AND 2. PROJECTED REVENUES FROM COAL DEVELOPMENT WOULD NOT BE SUFFICIENT IN THE FIRST FIVE YEARS TO PAY FOR NEEDED SERVICES. OVER THE LONG TERM, PROJECTED REVENUES WOULD EXCEED SERVICE COSTS IN FIVE OF THE SIX COUNTIES - BUT, IN SHERIDAN COUNTY, WYOMING, PROJECTED REVENUES WOULD LAG BEHIND PROJECTED SERVICE COSTS INDEFINITELY INTO THE FUTURE.

REPORTS AND PUBLICATIONS:

MONTANA AG. EXP. STATION. ´ANTICIPATED EFFECTS OF MAJOR COAL DEVELOPMENT ON PUBLIC SERVICES, COSTS AND REVENUES IN SIX SELECTED COUNTIES´. RESEARCH REPORT NO. 82, MONTANA STATE UNIVERSITY, BOZEMAN, APRIL, 1975.

*****

00000357

PROJECT TITLE:

DECKER-BIRNEY SOCIOECONOMIC STUDY

INVESTIGATORS:

MILTON G. PARSONS

RESISTIVITY FLY ASH FORMED BY COMBUSTION OF LOW-SULFUR-CONTENT WESTERN COALS BY ELECTROSTATIC PRECIPITATION, TO DEVELOP A DESIGN BASIS FOR SIZING OF ELECTROSTATIC PRECIPITATORS BASED ON LABORATORY TESTING PROCEDURES THAT CAN BE PERFORMED ON REASONABLY SMALL SAMPLES, AND TO DEVELOP NEW MATERIALS AND METHODS TO CONDITION FLY ASH TO IMPROVE COLLECTION EFFICIENCY.

REPORTS AND PUBLICATIONS:

1. S. J. SELLE, P. H. TUFTE, ET AL. ´A STUDY OF THE ELECTRICAL RESISTIVITY OF FLY ASHES FROM LOW-SULFUR WESTERN COALS USING VARIOUS METHODS.´ PRESENTED BY AIR POLLUTION CONTROL ASSOCIATION 65TH ANNUAL MEETING PREPRINT NO. 7 (2) 107, JUNE 1972, 21 PP.
2. SELLE, STANLEY J., LINDSAY L. HESS, AND EVERETT A. SONDREAL. ´WESTERN FLY ASH COMPOSITION AS AN INDICATOR OF RESISTIVITY AND PILOT ESP REMOVAL EFFICIENCY.´ PRESENTED AT THE 68TH ANNUAL AIR POLLUTION CONTROL ASSOCIATION MEETING, JUNE 1975. PREPRINTS OF BOTH PAPERS AVAILABLE FROM AUTHORS, AT GRAND FORKS ENERGY RESEARCH CENTER.

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00000353

PROJECT TITLE:
WILDLIFE & WILDLIFE HABITAT BASELINE AND MONITORING, TRACT III

INVESTIGATORS:
63-23-A

PROJECT SUPERVISOR:
ROBERT E. CARROLL
ECOLOGICAL CONSULTING SERVICE
1300 BLOCK CEDAR ST.
HELENA, MT 59601

PRIMARY SPONSOR:
WESTMORELAND RESOURCES
DAVID SIMPSON
BOX 449
HARDIN, MT

PRIMARY FUNDING AMOUNT:
PROPRIETARY

TIME FRAME:
06 30 73 TO CONTINUING

LOCATION:
MT - BIG HORN COUNTY - SARPY CREEK

ABSTRACT:
TO OBTAIN 4-SEASON BASELINE OF WILDLIFE AND WILDLIFE HABITAT ON TRACT III AND MONITORING WILDLIFE & HABITAT PARAMETERS ANNUALLY.

REPORTS AND PUBLICATIONS:
ANNUAL REPORT (´73, ´74, ´75) TO WESTMORELAND RESOURCES. FILED WITH DEPT. STATE LANDS

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00000354

PROJECT TITLE:
WILDLIFE & WILDLIFE HABITAT BASELINE AND MONITORING OF BIG SKY MINE

PROJECT NUMBER:
55-23-A

PROJECT SUPERVISOR:
ROBERT E. CARROLL
ECOLOGICAL CONSULTING SERVICE
1300 BLOCK CEDAR ST.
HELENA, MT 59601

PRIMARY SPONSOR:
PEABODY COAL CO.
JACK BECKNER
301 NORTH MEMORIAL DR.
ST. LOUIS, MISSOURI

PRIMARY FUNDING AMOUNT:
PROPRIETARY

TIME FRAME:
06 30 73 TO CONTINUING

LOCATION:
MT - BIG SKY MINE, ROSEBUD COUNTY

ABSTRACT:
TO OBTAIN 4-SEASON BASELINE OF WILDLIFE & WILDLIFE HABITAT AT BIG SKY MINE AND MONITORING WILDLIFE AND HABITAT PARAMETERS ANNUALLY.

REPORTS AND PUBLICATIONS:
ANNUAL REPORT (´73, ´74, ´75) TO PEABODY COAL CO. FILED WITH DEPT. STATE LANDS

*****

00000355

PROJECT TITLE:
IMPACT OF COLSTRIP UNITS 3 AND 4 ON PUBLIC SERVICE REQUIREMENTS

INVESTIGATORS:
DONALD W. PATTERSON

PROJECT SUPERVISOR:
ANNE S. WILLIAMS
MONTANA STATE UNIV., INST. OF APPLIED RESEARCH
BOZEMAN, MT 59715

PRIMARY SPONSOR:
MONTANA DEPT. OF SOCIAL & REHABILITATION SERVICES

PRIMARY FUNDING AMOUNT:
23,000

TIME FRAME:
09 01 73 TO 08 31 74

STATUS:
COMPLETED 08 31 74

LOCATION:
MT

ABSTRACT:

OBJECTIVES OF THE STUDY WERE TO: 1. IDENTIFY THE PUBLIC SERVICE NEEDS WHICH WOULD ACCOMPANY CONSTRUCTION OF COLSTRIP GENERATORS NO. 3 AND NO. 4. 2. IDENTIFY THE DISPARITIES (IF ANY) BETWEEN PROJECTED LEVELS OF POPULATION GROWTH AND THE AVAILABILITY OF PUBLIC SERVICES; 3. MAKE POLICY RECOMMENDATIONS TO CORRECT IDENTIFIED PUBLIC SERVICE DELIVERY PROBLEMS.

STUDY AREA INCLUDED ROSEBUD COUNTY, MONTANA AND NEARBY SERVICE CENTERS.

CONCLUSION WAS THAT EXISTING AND PLANNED PUBLIC SERVICES COULD NOT ADEQUATELY SERVE PROJECTED LEVEL OF POPULATION GROWTH THAT WOULD ACCOMPANY CONSTRUCTION OF THE PROPOSED GENERATORS, AND THAT THE MOST DIFFICULT TIMES WOULD OCCUR DURING PEAK CONSTRUCTION YEARS.

REPORTS AND PUBLICATIONS:
INSTITUTE OF APPLIED RES., MONTANA STATE UNIVERSITY. 'ANTICIPATED IMPACT OF COLSTRIP GENERATORS NO. 3 AND NO. 4 ON PUBLIC SERVICES'. BOZEMAN, JULY 1974. AVAILABLE FROM MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION, HELENA, MT.

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00000356

PROJECT TITLE:
IMPACT OF COAL DEVELOPMENT ON PUBLIC SERVICES IN THE NORTHERN PLAINS STATES

PROJECT SUPERVISOR:
ANNE S. WILLIAMS
MONTANA STATE UNIV., INST. OF APPLIED RESEARCH
BOZEMAN, MT 59715

COOPERATOR:
MONTANA STATE UNIV., AG. EXP. STATION

PRIMARY SPONSOR:
NORTHERN GREAT PLAINS RESOURCES PROGRAM

PRIMARY FUNDING AMOUNT:
9,500

TIME FRAME:
09 01 73 TO 08 31 74

STATUS:
COMPLETED 08 31 74

LOCATION:
MT ND WY

ABSTRACT:

STUDY AREA INCLUDED BIG HORN AND ROSEBUD COUNTIES IN MONTANA, MERCER AND OLIVER COUNTIES IN NORTH DAKOTA, AND SHERIDAN AND CAMPBELL COUNTIES IN WYOMING. OBJECTIVES WERE: 1. TO IDENTIFY THE PUBLIC SERVICE NEEDS WHICH WOULD ACCOMPANY THREE LEVELS OF PROJECTED COAL DEVELOPMENT IN THE THREE NORTHERN PLAINS STATES, 2. TO DETERMINE THE SOURCES AND AMOUNT OF TAX REVENUE LIKELY TO BE GENERATED UNDER THE THREE COAL DEVELOPMENT SCENARIOS, 3. TO IDENTIFY THE DISPARITIES (IF ANY) BETWEEN PUBLIC SERVICE NEEDS AND AVAILABILITY OF REVENUE TO PAY FOR THEM, AND 4. TO MAKE POLICY RECOMMENDATIONS TO CORRECT IDENTIFIED PUBLIC SERVICE DELIVERY PROBLEMS.

MAJOR POLICY RELEVANT CONCLUSIONS WERE: 1. EXISTING PUBLIC SERVICES IN NONE OF THE SIX COUNTIES STUDIED COULD ADEQUATELY ACCOMMODATE THE LEVEL OF POPULATION GROWTH ANTICIPATED UNDER ANY OF THE THREE COAL DEVELOPMENT SCENARIOS; AND 2. PROJECTED REVENUES FROM COAL DEVELOPMENT WOULD NOT BE SUFFICIENT IN THE FIRST FIVE YEARS TO PAY FOR NEEDED SERVICES. OVER THE LONG TERM, PROJECTED REVENUES WOULD EXCEED SERVICE COSTS IN FIVE OF THE SIX COUNTIES - BUT, IN SHERIDAN COUNTY, WYOMING, PROJECTED REVENUES WOULD LAG BEHIND PROJECTED SERVICE COSTS INDEFINITELY INTO THE FUTURE.

REPORTS AND PUBLICATIONS:
MONTANA AG. EXP. STATION. 'ANTICIPATED EFFECTS OF MAJOR COAL DEVELOPMENT ON PUBLIC SERVICES, COSTS AND REVENUES IN SIX SELECTED COUNTIES'. RESEARCH REPORT NO. 82, MONTANA STATE UNIVERSITY, BOZEMAN, APRIL, 1975.

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00000357

PROJECT TITLE:
DECKER-BIRNEY SOCIOECONOMIC STUDY

INVESTIGATORS:
MILTON G. PARSONS

PROJECT SUPERVISOR:
PATRICK C. JOBES
MONTANA STATE UNIV., DEPT. OF SOCIOLOGY
BOZEMAN, MT 59715
PRIMARY SPONSOR:
MONTANA ENERGY ADVISORY COUNCIL
PRIMARY FUNDING AMOUNT:
26,010
TIME FRAME:
07 01 74 TO 11 01 75
LOCATION:
MT
ABSTRACT:
THE PURPOSE OF THIS STUDY WAS TO IDENTIFY ATTITUDINAL PREDILECTIONS AND TO DEVELOP A DESCRIPTION OF ENVIRONMENTAL ORIENTATIONS HELD BY RESIDENTS OF THE THREE COUNTIES OF EASTERN MONTANA (BIG HORN, POWDER RIVER, AND ROSEBUD) THAT WILL BE AFFECTED IF STRIP MINING OF FEDERALLY OWNED COAL IS ALLOWED IN THE DECKER-BIRNEY AREA. THE DESCRIPTIONS WILL AID IN BETTER UNDERSTANDING THE PHILOSOPHICAL MOTIVATIONS OF RESIDENTS AS THEY WRESTLE WITH THE PROS AND CONS OF COAL DEVELOPMENT AND HELP DEVELOP BETTER PUBLIC EDUCATION STRATEGIES CENTERED AROUND ENERGY ISSUES.
REPORTS AND PUBLICATIONS:
SATISFACTION, COAL DEVELOPMENT AND LAND USE PLANNING: A REPORT OF ATTITUDES HELD BY RESIDENTS OF THE DECKER-BIRNEY STUDY AREA

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00000358
PROJECT TITLE:
CHANGES IN POPULATION AND COMMUNITY SERVICES RELATED TO CHANGES IN INDUSTRIAL STRUCTURE OF RURAL COMMUNITIES
PROJECT SUPERVISOR:
LLOYD D. BENDER, ECONOMIST
MONTANA STATE UNIV., DEPT. OF AG. ECONOMICS & ECONOMICS
105 LINFIELD HALL
BOZEMAN, MT
PRIMARY SPONSOR:
U.S. DEPT. OF AG., ECONOMIC RESEARCH SERVICE
PRIMARY FUNDING AMOUNT:
35,000
TIME FRAME:
06 30 73 TO 06 30 76
LOCATION:
MT ND SD WY
ABSTRACT:
OBJECTIVES: ANALYZE CONSEQUENCES OF ALTERNATIVE COAL DEVELOPMENT ON NEEDS FOR INFRASTRUCTURE AND COSTS AND REVENUES OF LOCAL GOVERNMENTS.
REPORTS AND PUBLICATIONS:
"ANCILLARY EMPLOYMENT MULITPLIERS FOR THE NORTHERN PLAINS PROVINCE"
"A RESEARCH PERSPECTIVE ON LOCAL ENERGY DEVELOPMENT IMPACTS"
"PREDICTING EMPLOYMENT IN FOUR REGIONS OF THE WESTERN U.S."

*****

00000359
PROJECT TITLE:
ECONOMIC DIVERSIFICATION - A PRIMER FOR ECONOMIC CHANGE
PROJECT NUMBER:
054
INVESTIGATORS:
NEAL F. JACQUOT; VAN LINDQUIST
PROJECT SUPERVISOR:
LARRY FINNERTY
SOUTH DAKOTA SIXTH DISTRICT COUNCIL OF LOCAL GOVERNMENTS
P.O. BOX 1586
RAPID CITY, SD 57701
PRIMARY SPONSOR:
U.S. DEPT. OF COMMERCE, ECONOMIC DEVELOPMENT ADMIN.
GEORGE DEL FUOCCO
TITLE BLDG. - 909 17TH ST. - SUITE 505
DENVER, CO 80202
SECONDARY SPONSORS:
SOUTH DAKOTA DEPT. OF TOURISM & INDUSTRIAL DEVELOPMENT
STATE OFFICE BLDG #2
PIERRE, SD 57501
PRIMARY FUNDING AMOUNT:
30,000
SECONDARY FUNDING AMOUNT:
10,000
TIME FRAME:
01 01 75 TO 12 31 75
STATUS:
TO BE PRINTED IN FEB., 1976
LOCATION:
SD - 11 WESTERN COUNTIES
ABSTRACT:
IT IS THE INTENTION OF THIS DOCUMENT TO SUGGEST CHANGES IN THE REGIONAL ECONOMY OF THE SIXTH DISTRICT (11 WESTERN COUNTIES IN SOUTH DAKOTA). COAL DEVELOPMENT IS ALLUDED TO IN PORTIONS OF THIS DOCUMENT, (PRIMARILY THAT ADJOINING THE SIXTH DISTRICT IN NORTHEASTERN WYOMING). WITHIN THE SIXTH DISTRICT, MINING AND TIMBER PROCESSING ARE PART OF THE STATEGY OF THIS DOCUMENT.
REPORTS AND PUBLICATIONS:
N. JACQUOT AND VAN LINDQUIST. ECONOMIC DIVERSIFICATION - A PRIMER FOR ECONOMIC CHANGE. SIXTH DISTRICT COUNCIL OF

LOCAL GOVERNMENTS, RPT. NO. 054. AVAILABLE FEB., 1976.

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00000350
PROJECT TITLE:
SOCIOECONOMIC BASELINE REPORT FOR CROW INDIAN COAL LEASES
PROJECT NUMBER:
W-8
INVESTIGATORS:
JAN BARRINGER
MOUNTAIN WEST RESEARCH, INC.
123 E. UNIV. DR., SUITE 219
TEMPE, AZ 85281
J. A. CHALMERS
DEPT. OF ECONOMICS
ARIZONA STATE UNIV.
TEMPE, AZ 85281
PROJECT SUPERVISOR:
DWAYNE JELINEK
MOUNTAIN WEST RESEARCH, INC.
280 COLUMBINE ST., SUITE 301
DENVER, CO
PRIMARY SPONSOR:
WESTMORELAND RESOURCES
DAVID SIMPSON
P.O. BOX 449
HARDIN, MT 59034
PRIMARY FUNDING AMOUNT:
67,000
TIME FRAME:
01 01 75 TO 12 15 75
STATUS:
COMPLETED 12 15 75
LOCATION:
MT - YELLOWSTONE, BIG HORN, ROSEBUD, TREASURE, CUSTER, POWDER RIVER COUNTIES
ABSTRACT:
THE OBJECT OF THE STUDY WAS TO PROVIDE BASELINE INFORMATION FOR THE PREPARATION OF IMPACT ASSESSMENTS ASSOCIATED WITH THE VIEWING OF CROW COAL BY WESTMORELAND RESOURCES COMPANY. THE FIANAL REPORT HAS 4 SECTIONS. THE REGIONAL ANALYSIS USES AN ECONOMIC-DEMOGRAPHIC SIMULATION MODEL TO EXAMINE THE ALTERNATIVE FUTURES THAT MAY FACE THE SIX-COUNTY STUDY AREA (THE COUNTIES LISTED ABOVE). THE SECOND SECTION INVESTIGATES THE PUBLIC REVENUE AND EXPENDITURE IMPLICATIONS OF COAL DEVELOPMENT. A DETAILED EXAMINATION IS THEN MADE OF SOCIAL AND ECONOMIC CONDITIONS IN A THREE-COUNTY PRIMARY IMPACT AREA (BIG HORN, ROSEBUD AND TREASURE COUNTIES). EMPHASIS IS PLACED ON A ACCURATELY PORTRAYING THE EXTENT AND ADEQUACY OF PUBLIC FACILITIES AND HOUSING, THE FISCAL SITUATION OF COUNTY AND MUNICIPAL JURISDICTION, AND THE ATTITUDES OF AREA RESIDENTS TOWARDS COAL DEVELOPMENT. THE FINAL SECTION OF THE REPORT EXAMINES SOCIAL AND ECONOMIC CONDITIONS ON THE CROW RESERVATION.
REPORTS AND PUBLICATIONS:
ENVIRONMENTAL BASELINE STUDIES FOR CROW INDIAN COAL LEASES: SOCIOECONOMIC REPORT. PREPARED BY MOUNTAIN WEST RESEARCH, INC. FOR WESTMORELAND RESOURCES. DEC., 1975. REPORT CAN BE OBTAINED FROM MOUNTAIN WEST RESEARCH, INC., 123 E. UNIVERSITY DR., SUITE 219, TEMPE, AZ 85281

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00000351
PROJECT TITLE:
WYOMING HUMAN SERVICES PROJECT
PROJECT NUMBER:
43-8929
PROJECT SUPERVISOR:
JULIE M. UHLMANN
UNIV. OF WYOMING
ARTS & SCIENCES 310
LARAMIE, WY 82071
PRIMARY SPONSOR:
NATIONAL INSTITUTE OF MENTAL HEALTH
RALPH SIMON
5600 FISHER'S LANE
ROCKVILLE, MD 20852
SECONDARY SPONSORS:
ECONOMIC DEVELOPMENT ADMINISTRATION
GEORGE DEL FUOCO
909 17TH ST.
DENVER, CO 80202
WYOMING DEPT. OF PUBLIC ASSISTANCE & SOCIAL SERVICES
JANET LANE
STATE OFFICE BUILDING
CHEYENNE, WY 82002
PRIMARY FUNDING AMOUNT:
TOTAL 478,537
FY 76 - 117,509; FY 77 - 108,079; FY 78 - 98,167; FY 79 - 95,399; FY 80 - 69,383
SECONDARY FUNDING AMOUNT:
60,000 (EDA)
18,427 -WY. DEPT. OF PUBLIC ASSISTANCE & SOCIAL SERVICES)
TIME FRAME:
07 01 75 TO 06 30 80
LOCATION:
WY - CAMPBELL, PLATTE, CONVERSE, JOHNSON, SWEETWATER COUNTIES
ABSTRACT:
THE WYOMING HUMAN SERVICES PROJECT TRAINS STUDENTS IN

THEIR FINAL YEAR OF COURSE WORK AT THE UNIVERSITY OF WYOMING (B.A., M.A., THIRD YEAR LAW OR DOCTORAL LEVEL) TO WORK IN MULTIDISCIPLINARY TEAMS IN WYOMING COMMUNITIES FOR A PERIOD OF ONE YEAR AFTER GRADUATION FROM THE UNIVERSITY. TEAM MEMBERS WORKING IN THE COMMUNITIES ARE NEW SALARIED PROFESSIONALS WHO WORK IN HUMAN SERVICE AREAS SUCH AS MENTAL HEALTH, SOCIAL SERVICES, LAW, RECREATION, DAY CARE, PUBLIC HEALTH, PUBLIC ADMINISTRATION, EDUCATION, ENGINEERING, LAW ENFORCEMENT, ETC. EACH TEAM SPENDS ONE YEAR IN THE COMMUNITY WHILE A NEW TEAM IS BEING TRAINED TO TAKE OVER DURING THE FOLLOWING YEAR OF THIS FIVE-YEAR PROGRAM.

DURING THE YEAR'S JOB PLACEMENT IN A COMMUNITY, INDIVIDUAL TEAM MEMBERS SPEND HALF THEIR WORK TIME WITH A LOCAL HUMAN SERVICE AGENCY PROVIDING DIRECT SERVICES, OR EXTRA HANDS, TO THE AGENCY. THE OTHER HALF OF THEIR TIME IS SPENT AS A TEAM WORKING ON COMMUNITY PROJECTS RELATED TO THE IMPROVEMENT OF HUMAN SERVICES WITHIN THE COMMUNITY. FOR EXAMPLE, THE TEAM MIGHT ESTABLISH A HUMAN SERVICES INFORMATION AND REFERRAL SERVICE FOR THE COMMUNITY. THE PURPOSE OF THE TEAM IN THE COMMUNITY, IN BOTH ITS AGENCY AND TEAM FUNCTIONS, IS TO WORK TOWARD RELIEVING SOME OF THE PRESSURES RESULTING FROM THE INCREASING HUMAN PROBLEMS RELATED TO ENERGY IMPACT. WHILE IN THE COMMUNITY, THE TEAM ALSO WORKS CLOSELY WITH A COMMUNITY ADVISORY BOARD AND A PROJECT FIELD COORDINATOR.

CURRENTLY THE WHSP HAS A TEAM OF SEVEN HUMAN SERVICE ASSOCIATES IN GILLETTE, WYOMING. TWO TEAMS ARE PROJECTED FOR 1976-77. ONE TEAM WILL BE LOCATED IN GILLETTE AND THE OTHER WILL BE LOCATED IN WHEATLAND, WYOMING. THE PROJECT GOAL IS TO HAVE THREE FIVE-PERSON TEAMS IN THREE DIFFERENT WYOMING COMMUNITIES.

OVERALL PROJECT GOALS ARE 1- TO GO BEYOND THE IDENTIFICATION OF IMPACT PROBLEMS TO A PROGRAM OF ACTION DESIGNED TO ASSIST IN THE RESOLUTION OF THESE PROBLEMS; 2- TO OBTAIN AN HOLISTIC VIEW OF THE HUMAN SERVICE DELIVERY SYSTEM IN THE COMMUNITY; 3- TO TRAIN HUMAN SERVICE WORKERS IN A TEAM APPROACH TO HUMAN SERVICES BEFORE THEY BECOME LOCKED IN TO THEIR RESPECTIVE DISCIPLINES; AND 4- TO DERIVE SUGGESTIONS AND GUIDELINES FOR OTHER IMPACTED COMMUNITIES AS TO HOW TO MOST EFFECTIVELY DELIVERY HUMAN SERVICES UNDER IMPACT CONDITIONS.

REPORTS AND PUBLICATIONS:

"GILLETTE HUMAN SERVICES PROJECT: SEMI-ANNUAL REPORT, DECEMBER 31, 1975."

MONTHLY PROJECT REPORT.

AVAILABLE FROM WYOMING HUMAN SERVICES PROJECT, UNIVERSITY OF WYOMING, ARTS & SCIENCES 710, LARAMIE, WYOMING 82071

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00000362

PROJECT TITLE:

PHOTO INTERPRETATION FOR CULTURAL RESOURCES

PROJECT NUMBER:

119-29-8

PROJECT SUPERVISOR:

ROBERT E. CARROLL
ECOLOGICAL CONSULTING SERVICE
1300 BLOCK CEDAR ST.
HELENA, MT 59601

PRIMARY SPONSOR:

U.S. BUREAU OF LAND MANAGEMENT, MONTANA STATE OFFICE
DAN MARTIN
FEDERAL BUILDING
BILLINGS, MT 59101

PRIMARY FUNDING AMOUNT:

49,000

TIME FRAME:

06 30 75 TO 07 31 76

LOCATION:

ND - 4,380 SQ. MILES INCLUDING PARTS OF MERCER, OLIVER & DUNN COUNTIES

ABSTRACT:

TO LOCATE ALL KNOWN ARCHAEOLOGICAL SITES AND PLOT ON OVERLAYS ON 1:80,000 SCALE QUAD-CENTERED FALSE COLOR INFRARED AERIAL PHOTOGRAPHY, DETERMINE SITE CHARACTERISTICS, INTERPRET THE CIR FOR INDICATIONS OF THESE CHARACTERISTICS, PERFORM GROUND TRUTH TO DETERMINE WHETHER CULTURAL RESOURCES CAN BE FOUND BY INTERPRETATION OF SMALL SCALE CIR.

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00000363

PROJECT TITLE:

YELLOWSTONE RIVER BASIN AND ADJACENT COAL AREA LEVEL "B" ANALYSIS

PROJECT SUPERVISOR:

JERRY W. KNAPP, STUDY MANAGER
HARZA ENGINEERING CO.
150 SOUTH WACKER DR.
CHICAGO, IL 60606
TRANSWESTERN LIFE BLDG., ROOM 332, 404 N. 31ST ST.

COORDINATOR:

MISSOURI RIVER BASIN COMMISSION
ROBERT H. MADSEN
BILLINGS, MT 59101

PRIMARY SPONSOR:

MISSOURI RIVER BASIN COMMISSION

1.5 SOCIAL AND ECONOMIC STUDIES

NICHOLAS L. BARBAROSSA
10050 REGENCY CIRCLE - SUITE 403
OMAHA, NE 68114
SECONDARY SPONSORS:
U.S. WATER RESOURCES COUNCIL
SUITE 800, 2120 L ST. NW
WASHINGTON, DC 20037
PRIMARY FUNDING AMOUNT:
105,000
TIME FRAME:
01 19 76 TO 06 09 76
LOCATION:
MT ND WY - PORTIONS INCLUDED IN THE YELLOWSTONE RIVER DRAINAGE AND TRIBUTARIES DRAINING TO THE MISSOURI RIVER FROM THE WEST IN NORTH DAKOTA PLUS THE COUNTIES OF MUSSELSHELL, GARFIELD, MCCONE & RICHLAND IN MONTANA, MCLEAN IN NORTH DAKOTA, AND CROOK, WESTON, NIOBRARA, CONVERSE AND NATRONA IN WYOMING, ALL PARTS OF WHICH FALL OUTSIDE THE YELLOWSTONE OR WESTERN MISSOURI TRIBUTARIES BASINS.
ABSTRACT:
THE CONSULTANT WILL ACCOMPLISH AN ECONOMIC EVALUATION OF FUTURE ENERGY SUPPLIES AND DEMANDS AND PROJECT REGIONAL PARTICIPATION IN THE ENERGY MARKET BASED ON A LOW, MOST PROBABLE AND HIGH LEVEL OF PARTICIPATION. FROM THESE PROJECTIONS, ECONOMICALLY CONSISTENT IN-BASIN SYNTHETIC FUELS AND THERMAL ELECTRIC POWER PLANTS AND TRANSPORTATION NETWORKS WILL BE PREDICTED RECOGNIZING WATER AND AIR QUALITY STANDARDS, RECLAMATION REQUIREMENTS; OTHER ENVIRONMENTAL FACTORS AND SOCIAL IMPLICATIONS. TWO MODELS WILL BE DEVELOPED: A MACRO MODEL TO ASSESS NATIONAL ENERGY IMPLICATIONS AND REGIONAL ALLOCATIONS AND A MICRO MODEL TO SITE PLANTS AND TRANSPORTATION FACILITIES RECOGNIZING LOCAL CONDITIONS AND CONSTRAINTS. UPON COMPLETION THE MODELS MAY BE USED TO ANSWER ´WHAT IF´ QUESTIONS CONCERNING SHIFTS IN ANY OF THE FACTORS RELATING TO REGIONAL PARTICIPATION IN THE NATIONAL ENERGY PICTURE.

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00000364
PROJECT TITLE:
PROJECTING COAL GASIFICATION IN THE NORTHERN GREAT PLAINS
PROJECT SUPERVISOR:
RICHARD L. STROUP
MONTANA STATE UNIV., AG. ECON. & ECONOMICS DEPT.
COOPERATOR:
UNIV. OF MONTANA
MONTANA TECH.
PRIMARY SPONSOR:
NATIONAL SCIENCE FOUNDATION, RANN
PRIMARY FUNDING AMOUNT:
PROPRIETARY
TIME FRAME:
05 01 75 TO 10 31 75
LOCATION:
MT ND SD WY NE
ABSTRACT:
PROJECTS COAL USE BY STATE FOR SUBSTITUTE NATURAL GAS AND COMPARES PROJECTIONS WITH THOSE OF OTHER RESEARCHERS.
REPORTS AND PUBLICATIONS:
THE POLITICAL ECONOMY OF COAL GASIFICATION: SOME DETERMINANTS OF DEMAND FOR WESTERN COAL (MSU AG. ECON. STAFF PAPER 75-17)

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00000365
PROJECT TITLE:
MHD SYSTEMS, INSTRUMENTATION AND CONTROL -RECOVERY AND UTILIZATION OF DILUTE NITRIC OXIDE FROM AN MHD GENERATOR
INVESTIGATORS:
F. P. MCCANDLESS
MONTANA STATE UNIV., DEPT. OF CHEMICAL ENG.
BOZEMAN, MT 59715
PROJECT SUPERVISOR/RESEARCH INST
MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
BOX 3809
BUTTE, MT 59701
COOPERATOR:
MONTANA COLLEGE OF MINERAL SCIENCES AND TECHNOLOGY
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
41,417
TIME FRAME:
03 19 75 TO 07 31 75
LOCATION:
MT
ABSTRACT:
THE CONTRACTOR SHALL CONDUCT A STUDY OF THE BENEFITS FROM AND POTENTIAL PROCESSES FOR THE PRODUCTION OF NITRIC ACID AND/OR A FIXED NITROGEN FERTILIZER FROM THE DILUTE NITRIC OXIDE CONTAINING GAS STREAM OF AN MHD POWER PLANT. THE STUDY WILL INCLUDE IDENTIFICATION OF AREAS CRITICAL TO THE RECOVERY AND UTILIZATION OF THE DILUTE NOX AND IDENTIFY APPROPRIATE LABORATORY EXPERIMENTS.

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00000366
PROJECT TITLE:
RECOVERY AND UTILIZATION OF DILUTE NITRIC OXIDE FROM AN MHD GENERATOR
INVESTIGATORS:
F. P. MCCANDLESS
MONTANA STATE UNIV., DEPT. OF CHEMICAL ENG.
BOZEMAN, MT 59715
PROJECT SUPERVISOR/RESEARCH INST
MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
BOX 3809
BUTTE, MT 59701
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
41,417
TIME FRAME:
04 01 75 TO 06 30 76
LOCATION:
MT
ABSTRACT:
THIS PROJECT IS AIMED AT THE DEVELOPMENT OF A VIABLE PROCESS FOR THE PRODUCTION OF NITRIC ACID AND/OR A FIXED NITROGEN FERTILIZER FROM THE DILUTE NITRIC OXIDE CONTAINING GAS STREAM PRODUCED DURING COMBUSTION IN AN MHD GENERATOR. THE STUDY WILL INCLUDE: 1. AN ENGINEERING AND ECONOMIC EVALUATION OF EXISTING PROCESSES FOR NO REMOVAL AND CONVERSION, INCLUDING A PRODUCT MARKET STUDY. 2. IDENTIFICATION OF AREAS CRITICAL TO THE RECOVERY AND UTILIZATION OF THE DILUTE NO, AND 3. BENCH SCALE EXPERIMENTS IN THESE CRITICAL AREAS.

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00000367
PROJECT TITLE:
PRELIMINARY DESIGN OF A DIRECT FIRED, FALLING-BED AIR PREHEATER FOR AN MHD GENERATOR TEST FACILITY
INVESTIGATORS:
R. L. MUSSULMAN

MONTANA STATE UNIV., DEPT. OF MECHANICAL ENG.
W. E. GENETTI
MONTANA STATE UNIV., DEPT. OF CHEMICAL ENG.
BOZEMAN, MT 59715
PROJECT SUPERVISOR/RESEARCH INSTITU:
MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
BOX 3809
BUTTE, MT 59701
COOPERATOR:
MONTANA COLLEGE OF MINERAL SCIENCES AND TECHNOLOGY
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
82,219
TIME FRAME:
03 18 75 TO 07 31 76
LOCATION:
MT
ABSTRACT:

THE CONTRACT SHALL UNDERTAKE THE PRELIMINARY DESIGN OF THE HIGH TEMPERATURE STAGE OF A DIRECT FIRED AIR PREHEATER FOR USE IN AN MHD GENERATOR TEST FACILITY THAT IS TO BE DIRECTLY FIRED BY VARIOUS COALS AT A THERMAL LEVEL PROPOSED BY THE CONTRACTOR AND APPROVED BY THE CONTRACTING AGENCY. THE DESIGN SHALL BE OF A FALLING BED CONFIGURATION THAT DELIVERS PREHEATED AIR AT 3100 DEGREES FAHRENHEIT. CONSIDERATION SHALL BE GIVEN TO HEAT TRANSFER, HEAT LOSS, PRESSURE LEVEL, PRESSURE LOSSES, CHAMBER GEOMETRIES, VALVING, HOPPER REQUIRED TO TRANSPORT PARTICLES FROM THE UPPER TO LOWER CHAMBER, METHODS TO DISTRIBUTE BED PARTICLES WITHIN CHAMBERS, PARTICLE SIZES, PARTICLE VELOCITIES, PARTICLE RECYCLING GAS VELOCITIES, SLAG REMOVAL POTENTIAL AND MATERIALS. EMPHASIS WILL BE ON DEVELOPING DESIGN AND OPERATION CRITERIA, INCLUDING PRELIMINARY LAYOUT DRAWINGS. FROM THESE, SMALL SCALE EXPERIMENTS OF THE FALLING BED CONCEPT SHALL BE DEFINED. PARAMETERS SUCH AS THERMAL EFFECTIVENESS, PRESSURE LOSSES, COAL TYPES, MATERIALS PROBLEMS, START UP AND SHUT DOWN, AND RELATIVE COSTS SHALL BE EXAMINED.

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0000368
PROJECT TITLE:
PHYSICAL PROPERTIES OF COAL SLAGS RELATED TO MHD SYSTEMS
INVESTIGATORS:
G. LAPEYRE
MONTANA STATE UNIV., DEPT. OF PHYSICS
BOZEMAN, MT 59715
PROJECT SUPERVISOR/RESEARCH INST
MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
BOX 3809
BUTTE, MT 59701
COOPERATOR:
MONTANA COLLEGE OF MINERAL SCIENCES AND TECHNOLOGY
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
72,755
TIME FRAME:
03 18 75 TO 07 31 76
LOCATION:
MT
ABSTRACT:

THE CONTRACTOR SHALL DESIGN, INITIATE CONSTRUCTION AND INSTRUMENTATION OF LABORATORY, BENCH SCALE APPARATUS FOR DETERMINING THE PHYSICAL PROPERTY OF COAL SLAG-SEED MIXTURES IN RELATION TO THE THERMIONIC WORK FUNCTION. THE APPARATUS SHALL BE CAPABLE OF OPERATING ISOTHERMALLY OVER A RANGE OF TEMPERATURE UP TO 2200 DEGREES CENTIGRADE AND TO BE COMPATIBLE WITH A VARIETY OF NATURAL AND SYNTHETIC SLAG-SEED MIXTURES.

THE CONTRACTOR SHALL CONDUCT INITIAL EXPERIMENTS AS FEASIBLE TO DEMONSTRATE PERFORMANCE AND ACCURACY. COMPARISONS WITH EXISTING DATA APPEARING IN THE LITERATURE AND KNOWN TO BE VALID SHALL BE PERFORMED.

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0000369
PROJECT TITLE:
MHD SYSTEMS, INSTRUMENTATION AND CONTROL - MHD SYSTEMS INSTRUMENTATION AND DATA ACQUISTION
INVESTIGATORS:
R. JOHNSON
MONTANA STATE UNIV., DEPT. OF ELECTRICAL ENG.
BOZEMAN, MT 59715
PROJECT SUPERVISOR/RESEARCH INST
MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
BOX 3809
BUTTE, MT 59701
COOPERATOR:
MONTANA COLLEGE OF MINERAL SCIENCES AND TECHNOLOGY
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
152,248
TIME FRAME:
03 18 75 TO 07 31 76
LOCATION:
MT
ABSTRACT:

THE CONTRACTOR SHALL CONDUCT A STUDY OF A COMPLETELY INTEGRATED DIRECT COAL FIRED BASE LOAD MHD-STEAM PLANT

HAVING A THERMAL INPUT OF 4000 MW. THE STUDY IS TO INCLUDE THE DETERMINATION OF THE DESIRED LOCATION, QUANTITY, DATA BASE REQUIREMENTS, PRELIMINARY INTERFACE REQUIREMENTS AND SOFTWARE STRUCTURE FOR THE INSTRUMENTATION AND CONTROL OF SUCH A FACILITY. CONSIDERATION SHALL ALSO BE GIVEN TO ENVIRONMENTAL, ECONOMIC AND SOCIAL ASPECTS IN THE LOCATION, SITING, EFFLUENT CONTROL AND WASTE OF SUCH A PLANT.

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00000370
PROJECT TITLE:
SLAG PHYSICAL PROPERTIES
INVESTIGATORS:
V. H. SCHMIDT
MONTANA STATE UNIV., DEPT. OF PHYSICS
BOZEMAN, MT 59715
PROJECT SUPERVISOR/RESEARCH INST
MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
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BUTTE, MT 59701
COOPERATOR:
MONTANA COLLEGE OF MINERAL SCIENCES AND TECHNOLOGY
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
70,747
TIME FRAME:
03 18 75 TO 07 31 76
LOCATION:
MT
ABSTRACT:

THE CONTRACTOR SHALL DESIGN, INITIATE CONSTRUCTION AND INSTRUMENTATION OF LABORATORY, BENCH SCALE APPARATUS FOR DETERMINING THE FOLLOWING PHYSICAL PROPERTIES OF COAL SLAG-SEED MIXTURES: ELECTRICAL CONDUCTIVITY, THERMAL CONDUCTIVITY, VISCOSITY, AND CONCENTRATIONS AND MOBILITY OF THE CURRENT CARRIERS. THE APPARATUS SHALL BE CAPABLE OF OPERATING ISOTHERMALLY OVER A RANGE OF TEMPERATURE UP TO 2200 DEGREES CENTIGRADE AND TO BE COMPATIBLE WITH A VARIETY OF NATURAL AND SYNTHETIC SLAG-SEED MIXTURES.

THE CONTRACTOR SHALL CONDUCT INITIAL EXPERIMENTS AS FEASIBLE TO DEMONSTRATE PERFORMANCE AND ACCURACY. COMPARISONS WITH EXISTING DATA APPEARING IN THE LITERATURE AND KNOWN TO BE VALID SHALL BE PERFORMED.

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00000371
PROJECT TITLE:
SLAG FLOW CHARACTERISTICS AND NOX KINETICS IN MHD HEAT EXCHANGERS
INVESTIGATORS:
H. W. TOWNES; T. C. REIHMAN
MONTANA STATE UNIV., DEPT. OF MECHANICAL ENG.
BOZEMAN, MT 59715
PROJECT SUPERVISOR/RESEARCH INST
MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
BOX 3509
BUTTE, MT 59715
COOPERATOR:
MONTANA COLLEGE OF MINERAL SCIENCES AND TECHNOLOGY
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
279,130
TIME FRAME:
03 18 75 TO 07 31 76
LOCATION:
MT
ABSTRACT:

THE CONTRACTOR SHALL DESIGN, PROCURE AND/OR FABRICATE A LABORATORY, BENCH SCALE MODERATE TEMPERATURE SLAG FLOW FACILITY (MTSFF) SUITABLE FOR EXPERIMENTALLY STUDYING THE BEHAVIOR OF SLAG FLOW UNDER CONDITIONS SIMULATING THOSE ANTICIPATED IN DIRECT FIRED HEAT EXCHANGERS FOR MHD TEST FACILITIES AND PLANTS. THE INITIAL TEST SECTIONS SHALL BE DIRECTED TOWARD THE MATERIALS AND CIRCULAR FLOW GEOMETRIES THAT APPROXIMATE THE FLOW CHANNELS OF PACKED BED, HIGH TEMPERATURE STAGE REGENERATIVE MHD AIR PREHEATERS. THE FACILITY SHALL USE OFF-THE-SHELF HARDWARE WHEREVER POSSIBLE AND CONSIST OF THE FOLLOWING MAJOR COMPONENTS: BURNER AND ASSOCIATED FUEL/SEED/AIR SYSTEM, ENTRANCE DUCTING, TEST HEAT EXCHANGER CHANNEL, EXHAUST SYSTEM AND ENVIRONMENTAL PROTECTION DEVICES, TEST SECTION WALL TEMPERATURE AND HEAT FLUX CONTROLS, FACILITY CONTROLS AND INSTRUMENTATION.

THE CONTRACTOR SHALL CONDUCT AN ANALYTICAL ANALYSIS OF THE SLAG FLOW PROBLEM. A MAJOR OBJECTIVE OF THIS MODEL IS TO PREDICT SLAG DEPOSITION RATES ON MHD HEAT EXCHANGER SURFACES.

THE CONTRACTOR SHALL CONDUCT A LITERATURE SURVEY AND A CRITICAL EVALUATION OF EXISTING COMPUTER PROGRAMS CONCERNING NOX CONCENTRATIONS IN MHD POWER PLANTS.

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00000372
PROJECT TITLE:
MHD SYSTEMS, INSTRUMENTATION AND CONTROL (CYCLE ANALYSIS AND CONTROL)
INVESTIGATORS:
D. PIERRE

MONTANA STATE UNIV., DEPT. OF ELECTRICAL ENG.
BUTTE, MT 59715
PROJECT SUPERVISOR/RESEARCH INST
MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
BOX 3809
BUTTE, MT 59701
COOPERATOR:
MONTANA COLLEGE OF MINERAL SCIENCES AND TECHNOLOGY
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
94,812
TIME FRAME:
03 18 75 TO 07 31 76
LOCATION:
MT
ABSTRACT:

THE CONTRACTOR SHALL CONDUCT A STUDY TO DETERMINE MHD INSTRUMENTATION AND DATA ACQUISITION REQUIREMENTS FOR CURRENT AND PLANNED TEST FACILITIES TO ACCURATELY ESTABLISH OPERATING CONDITIONS AND TO PROVIDE MIXIMUM DATA AVAILABILITY FOR ANY FAILURE MECHANISMS. THE EMPHASIS IS TO BE PLACED ON REAL-TIME DATA ANALYSIS AND CONTROL. CONSIDERATIONS SHALL BE GIVEN TO INSTRUMENTATION TYPE, LOCATIONS, ACQUISITION RATE AND DATA HANDLING.

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00000373
PROJECT TITLE:
SLAG SEED EQUILIBRIUM AND SEPARATION RELATED TO THE MHD SYSTEM
INVESTIGATORS:
R. WOODRIFF
MONTANA STATE UNIV., DEPT. OF CHEMISTRY
BOZEMAN, MT 59715
PROJECT SUPERVISOR/RESEARCH INST
MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
BOX 3809
BUTTE, MT 59701
COOPERATOR:
MONTANA COLLEGE OF MINERAL SCIENCES AND TECHNOLOGY
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
153,225
TIME FRAME:
03 18 75 TO 07 31 75
LOCATION:
MT
ABSTRACT:

THE CONTRACTOR SHALL OBTAIN THE VAPOR PRESSURE OF POTASSIUM SEED AND SEED COMPOUNDS AND OTHER SPECIES OVER LIQUID COAL SLAGS. AN EXISTING CONSTANT TEMPERATURE FURNACE SHALL BE MODIFIED AS REQUIRED FOR THIS PURPOSE, AND INSTRUMENTATION CAPABLE OF ACCURATE MEASUREMENT OF THE VAPOR PRESSURE OF VARIOUS ELEMENTS AND COMPOUNDS ABOVE SLAG AT TEMPERATURES UP TO 2200 DEGREES FAHRENHEIT SHALL BE DEVELOPED.

THE VAPOR PRESSURE OF K2O AND OTHER SPECIES AS FEASIBLE OVER AT LEAST TWO COAL SLAGS SHALL BE MEASURED OVER A RANGE OF TEMPERATURES.

COMPUTER PROGRAMS SHALL BE DEVELOPED FOR THE CALCULATION OF VAPOR PRESSURE OF POTASSIUM AND POTASSIUM-COMPOUNDS OVER A RANGE OF SLAG COMPOSITION AND TEMPERATURES.

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00000374
PROJECT TITLE:
MHD SYSTEMS, INSTRUMENTATION AND CONTROL - INVERTER
INVESTIGATORS:
R. DURNFORD
MONTANA STATE UNIV., DEPT. OF ELECTRICAL ENG.
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PROJECT SUPERVISOR/RESEARCH INST
MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
BOX 3309
BUTTE, MT 59715
COOPERATOR:
MONTANA COLLEGE OF MINERAL SCIENCES & TECHNOLOGY
PRIMARY SPONSOR:
U.S. ERDA
PRIMARY FUNDING AMOUNT:
42,342
TIME FRAME:
03 18 75 TO 07 31 76
LOCATION:
MT
ABSTRACT:

THE CONTRACTOR SHALL CONDUCT A STUDY OF DC TO AC INVERTER CONFIGURATIONS SUITABLE FOR USE WITH COMMERCIAL MHD GENERATORS. CONSIDERATION SHALL BE GIVEN TO INVERTERS FOR THREE TYPES OF CHANNELS: 1. TWO-TERMINAL DIAGONAL; 2. MULTI-TERMINAL DIAGONAL; 3. SEGMENTED FARADAY. THE ADVANTAGES AND DISADVANTAGES OF THE INDIVIDUAL VOLTAGE-CURRENT QUANTITIES DEVELOPED BY EACH OF THESE CHANNEL DESIGNS SHALL BE EVALUATED AND THE CONTROL OF THESE RELATIONSHIPS TOGETHER WITH THE TYPE AND DESIRABLE NUMBER OF INDIVIDUAL INVERTERS DETERMINED. THE INVERTER CONTROL IS TO BE EXAMINED ALONG WITH NECESSARY CIRCUITRY REQUIRED TO REALIZE AN INVERTER SYSTEM INTERFACING WITH AN MHD GENERATOR AND A POWER GRID SYSTEM. EMPHASIS

SHALL BE PLACED ON IDENTIFYING SUITABLE COMMERCIAL DEVICES.

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00000375
PROJECT TITLE:
COAL HYDROGENATION AND HYDROCRACKING USING A METAL CHLORIDE-GASEOUS HCL CATALYST SYSTEM
PROJECT SUPERVISOR:
F. P. MCCANDLESS
MONTANA STATE UNIV., DEPT. OF CHEMICAL ENG.
BOZEMAN, MT 59715
PRIMARY SPONSOR:
NATIONAL SCIENCE FOUNDATION
PRIMARY FUNDING AMOUNT:
55,959
TIME FRAME:
07 01 75 TO 06 30 77
LOCATION:
MT
ABSTRACT:

PRELIMINARY WORK LEADING TO THIS PROPOSAL WAS CARRIED OUT UNDER A GRANT FROM THE PETROLEUM RESEARCH FUND; 'MECHANISM OF HYDRODENITROGENATION USING A SUPPORTED NICL2-HCL CATALYST SYSTEM.' INITIAL RESEARCH WILL BE CONCERNED WITH THE DESIGN AND TESTING OF A CONTINUOUS REACTOR WHICH WILL UTILIZE A HIGH PRESSURE STAR FEEDER FOR CONTINUOUS POWDERED COAL FEED. VARIOUS REACTOR CONFIGURATIONS (TUBULAR, BOTH LARGE AND SMALL, FLUID BED, ETC.) WILL BE CONSIDERED AND A REACTOR DESIGNED SO THAT MEANINGFUL KINETIC DATA CAN BE OBTAINED. INITIAL EXPERIMENTS WILL BE CARRIED OUT TO FIND OPERATING CONDITIONS SO THAT THE ACTIVITY OF DIFFERENT CATALYSTS CAN BE COMPARED. THIS WILL BE FOLLOWED BY AN EXHAUSTIVE SCREENING OF POSSIBLE CANDIDATE CATALYSTS USING THE ABOVE CONDITIONS AS STANDARD. EMPHASIS WILL BE PLACED ON METAL CHLORIDES BUT OTHER MATERIALS (FOR EXAMPLE MOLYBDATE) IMPREGNATED ON THE COAL WILL BE TESTED IN THE HCL ENVIRONMENT. THE BEST CATALYSTS WILL BE FURTHER TESTED TO TRY TO ENHANCE THE ACTIVITY USING VARIOUS PROMOTORS. THIS WILL BE FOLLOWED BY FURTHER TESTS TO DETERMINE THE EFFECTS OF TEMPERATURE, PRESSURE, AMOUNT OF CATALYST IMPPEGNATED ON THE COAL, SPACE VELOCITY, H2 TO HCL RATIO, ETC. ON CONVERSION AND THE AMOUNT OF LIQUID AND GASEOUS PRODUCTS SO THAT THE VARIABLES CAN BE OPTIMIZED. KINETIC MODELS WILL BE DETERMINED BASED ON THESE DATA. ALONG WITH THE KINETIC STUDIES, RESEARCH WILL BE CARRIED OUT ON THE RECOVERY OF CATALYST FROM THE ASH OR UNREACTED COAL. RESEARCH WILL ALSO BE CARRIED OUT TO COMPLETELY CHARACTERIZE THE LIQUID, GAS AND UNREACTED COAL PRODUCTS.

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00000376
PROJECT TITLE:
RESEARCH ON THE CONVERSION OF COAL TO CLEAN DISTILLATE FUELS
INVESTIGATORS:
F. P. MCCANDLESS
PROJECT SUPERVISOR:
LLOYD BERG
MONTANA STATE UNIV., DEPT. OF CHEMICAL ENG.
BOZEMAN, MT 59715
PRIMARY SPONSOR:
U.S. ERDA
20 MASSACHUSETTS AVE. NW
WASHINGTON, DC 20545
PRIMARY FUNDING AMOUNT:
155,932
TIME FRAME:
06 20 75 TO 06 19 78
LOCATION:
MT
ABSTRACT:

FROM A LITERATURE REVIEW, IT IS OBVIOUS THAT NO GOOD PROCESS EXISTS TO CONVERT COAL TO A CLEAN FUEL IN A BOILING RANGE BELOW ITS DECOMPOSITION POINT. ONE OF THE BEST TO DATE IS THE USBM SYNTHOL PROCESS. IT PROPELS A SLURRIED -100 MESH COAL OVER A FIXED BED CATALYST WITH HYDROGEN. THE REACTOR IS 5/16 INCH DIAM., CATALYST IS 1/8 INCH PELLETS OF 2.4% COBALT, 10% MOLYBDENUM, TEMPERATURE 450 DEGREES CENTIGRADE, 4000 PSIG AND TWO MINUTES RESIDENCE TIME GIVES 1200 LBS. OF OIL/TON OF COAL AND REQUIRES 3500 FT3/BBL. OF OIL (440 LBS. OF OIL PER BBL.) TO GIVE A PRODUCT WHICH IS STILL LIQUID AT ROOM TEMPERATURE. WHAT THIS AND ALL THE OTHER LIQUEFACTION PROCESSES SEEMS TO BE TELLING US IS THAT CONDITIONS CONDUCIVE TO GOOD COAL CONVERSION ARE UNSATISFACTORY FOR THE PRODUCTION OF LIGHT LIQUIDS.

STERNBERG (USBM) HAS SHOWN THAT COAL IS RAPIDLY CONVERTED TO ASPHALTENES BUT THAT ASPHALTENES CONVERT VERY SLOWLY TO OILS. HE HAS NOW DETERMINED THAT ASPHALTENES ARE SALTS MADE UP OF A PYRIDINE-TYPE BASIC NITROGEN PLUS A PHENOLIC (ACIDIC) GROUP. IF THIS IS THE SITUATION, THEN IT SEEMS LIKELY THAT THE CONVERSION OF ASPHALTENES AND OTHER PRODUCTS FROM COAL LIQUEFACTION MAY WELL REQUIRE QUITE DIFFERENT CONVERSION CATALYSTS AND CONDITIONS. THIS IS PERHAPS THE REASON THAT NO SINGLE STEP PROCESS HAS EMERGED TO CONVERT COAL ALL THE WAY TO THE LIGHT FUELS.

SAMPLES OF THE PRODUCT FROM PAMCO, H-OIL, COED, AND CRESAP PROCESSES WILL BE OBTAINED. THEY WILL BE HEATED

AND PUMPED, WITH AND WITHOUT SOLVENT, INTO A CATALYTIC REACTOR IN THE PRESENCE OF HYDROGEN AND OTHER REDUCING GASES. VARIABLES TO BE INVESTIGATED WILL INCLUDE TEMPERATURE, PRESSURE, SPACE VELOCITY, HYDROGEN-TO-OIL RATIO, CHEMICAL NATURE OF THE SOLVENT. AS THIS PROPOSAL IS WRITTEN IT IS IMPOSSIBLE TO PREDICT WHAT ARRANGEMENT OF THE ABOVE CONDITIONS WILL PROVE TO BE THE OPTIMUM. THE USBM INVESTIGATED EIGHTY-FIVE COMMERCIAL CATALYSTS BEFORE ARRIVING AT THE CURRENT SYNTHOL CATALYST. IN GRIMM'S WORK CITED ABOVE, WE ARRIVED AT THE BEST CATALYST CARRIER FOR DIESEL OIL DESULFURIZATION IN SLIGHTLY FEWER ATTEMPTS.

WE WILL INVESTIGATE THE PERFORMANCE OF A WIDE VARIETY OF CATALYTIC MATERIALS AND CATALYST CARRIERS IN THE HYDROTREATING OF COAL DERIVED OILS AND TARS WHICH CONTAIN VARYING QUANTITIES OF METALS, SULFUR AND NITROGEN COMPOUNDS. THE PROGRAM WILL INCLUDE CATALYST LIFE STUDIES, HOPEFULLY TO SHED LIGHT ON THE REASONS FOR SPECIFIC CATALYST DEACTIVIATION AND PERHAPS TO DEVELOP MEANS FOR PROLONGING THE CATALYST LIFE. THE CATALYSTS TO BE STUDIED WILL INCLUDE NICKEL MOLYBDATE AND SULFIDE, COBALT MOLYBDATE AND SULFIDE, NICKEL TUNGSTATE AND OTHER COMBINATIONS ON CARRIERS SUCH AS MORDANITES AND OTHER MOLECULAR SIEVE TYPES.

ASTM DISTILLATIONS WILL BE THE METHOD OF DETERMINING YIELDS OF LIGHT FUELS. OCCASIONAL SAMPLES THAT ARE REPRESENTATIVE OF THE BEST CONDITIONS WILL BE SUBMITTED TO COMMERCIAL ANALYTICAL LABORATORIES FOR A COMPLETE EXAMINATION.

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00000377

PROJECT TITLE:
COAL HYDROGENATION
PROJECT SUPERVISOR:
LLOYD BERG
MONTANA STATE UNIV., DEPT. OF CHEMICAL ENG.
BOZEMAN, MT
PRIMARY SPONSOR:
AVCO EVERETT RESEARCH LABORATORY
EVERETT, MA
PRIMARY FUNDING AMOUNT:
41,734
TIME FRAME:
01 01 72 TO 06 30 75
STATUS:
COMPLETED 06 30 75
LOCATION:
MT
ABSTRACT:

A STUDY OF THE CONVERSION OF COLSTRIP SUB-BITUMINOUS COAL INTO LIQUID PRODUCTS USING CARBON MONOXIDE AND STEAM AS THE REDUCING AGENTS.

REPORTS AND PUBLICATIONS:
S. T. KUJAWA. MASTERS THESIS, MONTANA STATE UNIV., BOZEMAN - AUGUST, 1974

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00000378

PROJECT TITLE:
COAL LIQUEFACTION BY THE CO-STEAM PROCESS
PROJECT NUMBER:
BA-01-02
PROJECT SUPERVISOR:
E. A. SONDREAL
U.S. ERDA, GRAND FORKS ENERGY RESEARCH CENTER
BOX 8213, UNIV. STATION
GRAND FORKS, ND 58202
PRIMARY SPONSOR:
U.S. ERDA
WASHINGTON, DC 20545
PRIMARY FUNDING AMOUNT:
FY 76 - 400,000
TIME FRAME:
07 01 74 TO 06 30 83
LOCATION:
ND
ABSTRACT:

THE MAJOR OBJECTIVE OF THE PROJECT IS TO DEVELOP ENGINEERING DESIGN DATA FOR COMMERCIALIZATION OF THE CO-STEAM COAL LIQUEFACTION PROCESS FOR PRODUCTION OF LIQUID BOILER FUEL OF LOW SULFUR, NITROGEN, AND ASH CONCENTRATIONS FROM LOW-RANK WESTERN COALS. PRODUCT FUEL SHOULD BE ENVIRONMENTALLY ACCEPTABLE FOR COMBUSTION PROCESSES WITHOUT STACK GAS CLEANING. A SECONDARY OBJECTIVE IS THE UPGRADING OF PRIMARY PRODUCT TO REFINED FUELS AND CHEMICALS. INHOUSE WORK AT GFERC HAS THE GOALS OF OBTAINING BATCH RATE DATA UNDER EXPERIMENTAL CONDITIONS WHERE REACTOR WARMUP AND SAMPLING ARE NOT LIMITING AND OF APPLYING THESE DATA TO STUDIES ON REACTOR OPTIMIZATION IN A 10-LB/HR CONTINUOUS PROCESSING UNIT. IN ADDITION, PLANS ARE BEING LAID IN COOPERATION WITH THE PITTSBURGH ENERGY RESEARCH CENTER (PERC) FOR DESIGN, CONSTRUCTION AND OPERATION OF A 10-TPD PROCESS DEVELOPMENT UNIT (PDU) TO BE CONSTRUCTED AT GRAND FORKS UNDER CONTRACT. AN ANALYTICAL SUPPORT CAPABILITY FOR BOTH LABORATORY AND PDU PROGRAMS HAS BEEN ESTABLISHED AT GFERC AND PROGRESS IS BEING MADE ON THE GOAL OF DEVELOPING RAPID METHODS OF ANALYSIS TO DETERMINE REACTION RATES AND PRODUCT QUALITY.

REPORTS AND PUBLICATIONS:
J. E. SCHILLER AND D. M. NEAL. PREPARATION OF HYDRO-

1.5 ENERGY CONVERSION AND TRANSPORT

AROMATIC COMPOUNDS FOR MASS SPECTROMETRY STANDARDS IN COAL CONVERSION ANALYSIS. GFERC/RI-75/2, OCTOBER 1975, GRAND FORKS ENERGY RESEARCH CENTER, ERDA, GRAND FORKS, ND 58202. AVAILABLE FROM AUTHORS OR NATIONAL TECHNICAL INFORMATION SERVICE, USDC, SPRINGFIELD, VA 22161.

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00000379

PROJECT TITLE:

DESIGN AND EVALUATION OF IMPROVED SURFACE COAL MINE, OVERBURDEN HANDLING AND COAL EXTRACTION TECHNIQUES

PROJECT NUMBER:

J0255023

PROJECT SUPERVISOR:

DENNIS CALLAGHEN
THEODORE BARRY & ASSOCIATES
1151 W. SIXTH ST.
LOS ANGELES, CA 90017

PRIMARY SPONSOR:

U.S. BUREAU OF MINES, DENVER MIN. RESEARCH CENTER
GARY J. COLAIZZI
DENVER FEDERAL CENTER, BLDG. 20
DENVER, CO 80225

PRIMARY FUNDING AMOUNT:

147,000

TIME FRAME:

06 30 75 TO 05 30 75

ABSTRACT:

THE KEY TO INCREASED SURFACE COAL MINE PRODUCTIVITY IS TWO FOLD: INCREASED EFFICIENCY OF OVERBURDEN HANDLING TO EXPEDITE UNCOVERING THE COAL RESOURCE AND COMPLETING REQUIRED RECLAMATION, AND IMPROVED COAL HAULAGE SYSTEMS. THIS RESEARCH EFFORT WILL ASSUME THAT THE LATTER IS RESOLVED THROUGH PRODUCTION OF MORE HAULAGE UNITS AND WILL CONCENTRATE ON DEVELOPING AND DEMONSTRATING INNOVATIVE OVERBURDEN HANDLING SYSTEMS. SUCH SYSTEMS WILL BE DESIGNED WITHIN THE CAPABILITIES AND LIMITATIONS OF EXISTING SURFACE MINING EQUIPMENT. THROUGH REPROGRAMMING OF VARIOUS EQUIPMENT COMBINATIONS AND APPROPRIATE MODIFICATIONS OF THE MINE LAYOUT IT SHOULD BE POSSIBLE TO MINIMIZE OVERBURDEN REHANDLING REQUIRED TO ACHIEVE REQUIRED RECLAMATION AND THEREBY INCREASE THE OVERALL EXTRACTION EFFICIENCY IN AN ENVIRONMENTALLY ACCEPTABLE MANNER.

TYPE OF STUDY:

PART OF ´SURFACE MINING, EXTRACTION, RECLAMATION SUBPROGRAM,´ U.S. BUREAU OF MINES

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00000380

PROJECT TITLE:

DESIGN AND ENGINEERING FEASIBILITY OF RETREAT SURFACE AREA MINING SYSTEMS

PROJECT NUMBER:

J0255003

PROJECT SUPERVISOR:

S. BREALEY
PD-NCB
HOBART HOUSE, GROSVENOR PLACE
LONDON, SWIX 7 AE

PRIMARY SPONSOR:

U.S. BUREAU OF MINES, DENVER MIN. RESEARCH CENTER
DONALD DONNER
DMRC, BLDG. 20, DENVER FEDERAL CENTER
DENVER, CO 80225

PRIMARY FUNDING AMOUNT:

97,000

TIME FRAME:

03 09 75 TO 04 18 76

ABSTRACT:

A CONTRACT FOR A CONCEPTUAL DESIGN AND ENGINEERING FEASIBILITY STUDY WILL BE PROCURED TO DETERMINE THE PRACTICALITY OF SURFACE AREA MINING MODERATELY DIPPING COAL DEPOSITS IN A MANNER THAT MINIMIZES HIGHWALL REDUCTION AT THE CONCLUSION OF MINING AS WELL AS ELIMINATED THE HIGH COST OF HAUL RAMP MAINTENANCE THROUGH SPOIL AREAS AND SUBSEQUENT RECLAMATION OF SUCH HAULAGE ROUTES. POSSIBLE MINING SYSTEMS WOULD INCLUDE STARTING EITHER AT THE DEEPEST OVERBURDEN POINT AND MINING PARALLEL OR NORMAL TO THE STRIKE, OR BEGINNING AT THE SHALLOWEST POINT AND PROCEEDING NORMAL TO THE STRIKE UTILIZING PREESTABLISHED HAULAGE RAMPS THROUGH THE UNMINED AREA OR LOADING HAUL TRUCKS ON THE HIGHWALL. IF PRACTICAL, SUCH A MINING SYSTEM WOULD EXPEDITE CONTEMPORANEOUS RECLAMATION BY PERMITING NARROWER PIT WIDTHS ENABLING THE SPOIL SHOVEL TO SPREAD THE SPOIL OVER A GREAT ARC OF SWING AND BY CONTEMPORANEOUS OBLITERATION OF HAUL RAMPS AND ROADS AS MINING ADVANCES.

TYPE OF STUDY:

PART OF ´SURFACE MINING, EXTRACTION, RECLAMATION SUBPROGRAM,´ U.S. BUREAU OF MINES

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00000381
PROJECT TITLE:
PETROLOGY OF SANDSTONES, BRIDGER RANGE, MONTANA
PROJECT SUPERVISOR:
ROBERT A. CHADWICK
MONTANA STATE UNIV., DEPT. OF EARTH SCIENCES
BOZEMAN, MT 59715
PRIMARY SPONSOR:
MONTANA POWER CO.
40 E. BROADWAY
BUTTE, MT 59701
PRIMARY FUNDING AMOUNT:
10,863
TIME FRAME:
09 01 74 TO 08 31 75
STATUS:
COMPLETED 08 31 75
LOCATION:
MT
ABSTRACT:
A STUDY WAS CONDUCTED OF THE FRONTIER FORMATION OF CRETACEOUS AGE IN THE BRIDGER RANGE AND ADJACENT AREAS ON THE WESTERN MARGIN OF THE CRAZY MOUNTAINS BASIN. THE STUDY INCLUDED FIELD MAPPING AND MEASURING OF STRATIGRAPHIC SECTIONS OF THE FORMATION WHERE EXPOSED AND PETROGRAPHIC STUDY OF ROCK SAMPLES. A CONCEPT OF THE ENVIRONMENT OF DEPOSITION OF THE FORMATION WAS FORMULATED. THE OBJECTIVE WAS TO IMPROVE KNOWLEDGE OF THE FORMATION AND ITS EXTENT INTO THE CRAZY MOUNTAINS BASIN TO ALLOW A MORE INTELLIGENT EVALUAT ION OF ITS POTENTIAL AS A NATURAL GAS SOURCE.
REPORTS AND PUBLICATIONS:
TONNSEN, J. J.. "PETROGRAPHY, STRATIGRAPHY, AND ENVIRONMENT OF DEPOSITION OF THE FRONTIER FORMATION IN THE WESTERN PART OF THE CRAZY MOUNTAINS BASIN, SOUTH CENTRAL MONTANA." M.S. THESIS, 1975.

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00000382
PROJECT TITLE:
GEOTHERMAL RECONNAISSANCE OF SOUTHWESTERN MONTANA
PROJECT SUPERVISOR:
ROBERT A. CHADWICK
MONTANA STATE UNIV., DEPT. OF EARTH SCIENCES
BOZEMAN, MT 59715
PRIMARY SPONSOR:
U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.
PRIMARY FUNDING AMOUNT:
20,593
TIME FRAME:
05 18 75 TO 06 18 78
LOCATION:
MT
ABSTRACT:

A GEOLOGIC RECONNAISSANCE STUDY IS TO BE CONDUCTED TO MAKE A PRELIMINARY ASSESSMENT OF THE GEOTHERMAL POTENTIAL OF SOUTHWESTERN MONTANA. THE STUDY WILL LOOK AT THREE POTENTIAL SOURCES OR INDICATORS OF UNUSUAL HEAT AT DEPTH: HOT SPRINGS, HEAT FLOW FROM DRILL HOLES, AND RELATIVELY RECENT VOLCANISM IN THE AREA. MOST EMPHASIS WILL BE PLACED ON THE HOT SPRINGS. FIELD MAPPING OF SELECTED HOT SPRING AREAS WILL EMPHASIZE THESE PARAMETERS: MAJOR FAULTS, OPEN JOINT SYSTEMS, SYNCLINAL STRUCTURES, CAVERNOUS LIMESTONES, LINEAMENTS, IGNEOUS ROCKS, HOT ZONES IN SOILS, HYDROTHERMAL DEPOSITS, AND TRAVERTINE DEPOSITS. AN ATTEMPT WILL BE MADE TO ASCERTAIN THE CIRCULATION PATTERN OF WATER IN THE HOT SPRING SYSTEM. THE U.S. GEOLOGICAL SURVEY WILL COOPERATE BY MAKING HYDROLOGIC STUDIES OF THESE AREAS AND MONITOR SPRINGS TO DETERMINE DISCHARGE, TEMPERATURE, AND COMPOSITIONAL VARIATIONS OVER THE SEVERAL SEASONS OF THE YEAR.

REPORTS AND PUBLICATIONS:

TITLES SUBMITTED FOR MEETING OF AM. ASSOC. PETROLEUM GEOLOGISTS, BILLINGS, MONT., MARCH, 1976: CHADWICK, R. A., ET AL., ´GEOLOGIC CONTROLS OVER HOT WATER MIGRATION AT SELECTED HOT SPRINGS, SOUTHWESTERN MONTANA.´ STRUMSACKER, E. M.. ´PROPOSED GEOTHERMAL CIRCULATION PATTERN, CORWIN SPRINGS-GARDINER AREA, MONTANA.´

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000003=3
PROJECT TITLE:
   EMERGENCY ENERGY CONSERVATION PROJECT
PROJECT NUMBER:
   SAI-00340976
PROJECT SUPERVISOR:
   ROBERT HULL
   NORTHEAST SOUTH DAKOTA COMMUNITY ACTION PROGRAM
   520 2ND A.E. E.
   SISSETON, SD  57262
PRIMARY SPONSOR:
   U.S. DEPT. OF H.E.W., COMMUNITY SERVICES ADMINISTRATION
   1961 STOUT ST.
   DENVER, CO
SECONDARY SPONSORS:
   SOUTH DAKOTA DEPT. OF LABOR
   JAMES ELLENBECKER
   FOSS BLDG
   PIERRE, SD  57501
PRIMARY FUNDING AMOUNT:
   51,900
SECONDARY FUNDING AMOUNT:
   12,936
TIME FRAME:
   10 01 75 TO CONTINUING
LOCATION:
   SD  -  BEADLE, DAY, EDMUNDS, FAULK, HAND, MCPHERSON,
   MARSHALL, SPINK AND ROBERTS COUNTIES
ABSTRACT:
   THE PURPOSE OF THIS PROJECT IS AN ATTEMPT TO MEET THE
   NEEDS OF LOW INCOME PEOPLE THROUGH A HOME WINTERIZATION
   PROJECT.  THE PROJECT WILL WINTERIZE 250 HOMES AT A COST
   NOT TO EXCEED $200 PER HOME.  A WINTERIZATION PLAN WILL
   BE DEVELOPED FOR EACH DWELLING TO BE RETROFITTED.
   THE PLAN WILL INCLUDE AND INDICATE INFILTRATION PROBLEMS,
   CURRENT LEVELS OF INSULATION, OPTIMAL LEVEL OF WINTER-
   IZATION, COST OF MATERIALS, AND THE BEST POSSIBLE COM-
   BINATION OF TECHNIQUES FOR THE FUNDS AVAILABLE, AND PRIOR
   FUEL CONSUMPTION.  $51,900 COMES FROM COMMUNITY SERVICES
   ADMINISTRATION, $10,171 FROM LOCAL UNITS OF GOVERNMENT
   AND $12,936 FROM CETA PROGRAM ADMINISTERED BY S.D.
   DEPT. OF LABOR, $6,982.50 IS IN-KIND SERVICES FOR A
   TOTAL OF $81,989.50.
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00000384

PROJECT TITLE:
MINED AREA RECLAMATION AND RELATED LAND USE PLANNING

PROJECT NUMBER:
LIA-R2

INVESTIGATORS:
JAMES LAFEVERS
U.S. ERDA, ARGONNE NATIONAL LAB., ENERGY & ENV. SYSTEMS DIV.
BLDG. 12, 9700 S. CASS AVE.
ARGONNE, IL 60439

PROJECT SUPERVISOR:
EDGAR A. IMHOFF
U.S. GEOLOGICAL SURVEY, RESOURCE & LAND INVESTIGATIONS
MAIL STOP 750
NATIONAL CENTER, RESTON, VA 22092

PRIMARY SPONSOR:
U.S. GEOLOGICAL SURVEY, RESOURCE & LAND INVESTIGATIONS

SECONDARY SPONSORS:
U.S. DEPT. OF INTERIOR

PRIMARY FUNDING AMOUNT:
200,000

SECONDARY FUNDING AMOUNT:
100,000

TIME FRAME:
07 01 75 TO 12 31 76

LOCATION:
NATIONWIDE - SPECIFIC CASE STUDIES: AZ, OPEN PIT COPPER MINING; CO, SAND AND GRAVEL; ND, LIGNITE MINING

ABSTRACT:
BASED ON LITERATURE REVIEW AND STUDY OF REPRESENTATIVE FIELD CONDITIONS, TO PREPARE A REPORT WHICH SUMMARIZES, FOR THE LAND AND RESOURCE PLANNER, THE PROCESSES, METHODOLOGIES, AND ALTERNATIVE CHOICES THAT ARISE AS LAND IS CONVERTED TO SURFACE MINING AND IS LATER RECONVERTED INTO AN ASSET OR IS LEFT AS A LIABILITY. TO DEVELOP AND COMPILE A METHODOLOGY TO INTEGRATE LAND USE PLANS WITH MINING AND RECLAMATION PLANS.
THE METHODS USED ARE: BIBLIOGRAPHIC REVIEW, CASE STUDY ANALYSES, FIELD SURVEYS, STATE-OF-THE-ART SURVEYS, AND AN INTERPRETATION FOR LAND USE PLANNERS, ON HOW TO ACCOMPLISH INTEGRATED MINE, RECLAMATION, AND END-STATE LAND PLANNING.

TYPE OF STUDY:
PART OF 'RESOURCES AND LAND INVESTIGATIONS-RALI,' U.S. GEOLOGICAL SURVEY

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00000385

PROJECT TITLE:
CURRENT LAND USE MAPPING AND CONTOUR MAPPING OF 30 SQ. MILES AT GLASGOW AIR FORCE BASE

PROJECT NUMBER:
110-22-I

PROJECT SUPERVISOR:
ROBERT E. CARROLL
ECOLOGICAL CONSULTING SERVICE
1300 BLOCK CEDAR ST.
HELENA, MT 59601

PRIMARY SPONSOR:
MONTANA COLLEGE OF MINERAL SCIENCES & TECHNOLOGY FOUNDATION
DON BRELSFORD
BUTTE, MT

PRIMARY FUNDING AMOUNT:
5,000

TIME FRAME:
05 01 75 TO 05 31 75

STATUS:
COMPLETED 05 31 75

LOCATION:
MT - GLASGOW AIR FORCE BASE

ABSTRACT:
FROM 1:80,000 SCALE QUAD-CENTERED FALSE COLOR INFRARED FILM, PRODUCE FOUR 1:24,000 RECTIFIED BLACK & WHITE PHOTO QUADS CORRESPONDING TO 7 1/2 MINUTE U.S.G.S. TOPOGRAPHIC QUADS, PRODUCE A 1:12,000 PHOTO BASE WITH TOPOGRAPHIC CONTOURS OF A 30 SQ. MILE AREA INCLUDING GLASGOW AIR FORCE BASE, PRODUCE A CURRENT LAND USE OVERLAY AT 1:12,000 SCALE BY INTERPRETING CIR AND OBTAINING GROUND TRUTH, TO BE USED AS MAP BASE FOR ENERGY PARK FEASIBLITY STUDIES OF GLASGOW AFB.

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00000386

PROJECT TITLE:
ECONOMIC BASE AND LAND USE IMPACT STUDY OF GILLETTE AND CAMPBELL COUNTY, WYOMING

INVESTIGATORS:
J. KEVIN LAWLER
GLADSTONE ASSOCIATES
WASHINGTON, DC

PROJECT SUPERVISOR:
MAURICE L. MILLER
OBLINGER-SMITH CORP.
910 16TH ST. - 1221 UNIV. BLDG.

DENVER, CO 80202
PRIMARY SPONSOR:
GILLETTE/CAMPBELL CO. CITY-COUNTY PLANNING DEPT.
JOSEPH RACINE, PLANNING ENG.
DEPT. OF PLANNING AND DEVELOPMENT
BOX 540
GILLETTE, WY 82716
PRIMARY FUNDING AMOUNT:
23,000
TIME FRAME:
01 22 75 TO 06 01 76
LOCATION:
WY - GILLETTE, CAMPBELL CO.
ABSTRACT:

THE STUDY WILL NOT ONLY ADDRESS THE ECONOMIC IMPACTS OF ENERGY DEVELOPMENT, BUT WILL ANALYZE THE LAND USE IMPLICATIONS FROM RAPID GROWTH AND THE FISCAL IMPACT OF ECONOMIC DEVELOPMENT ON THE CITY AND COUNTY. THE TWO BASIC RESULTS OF THE STUDY WOULD BE AN ECONOMIC DEVELOPMENT STRATEGY FOR THE CITY AND COUNTY AND A STRATEGY FOR LAND PLANNING IN THE GILLETTE AREA. THE CONSULTANTS STRESS USEABILITY OF THE INFORMATION FOR FUTURE COMPREHENSIVE LAND PLANNING BY THE CITY AND COUNTY.

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00000387

PROJECT TITLE:

LEGAL ANALYSIS OF FEDERAL PROGRAMS WHICH COULD SUPPLY INFRASTRUCTURE SUPPORT TO ENERGY RESOURCE DEVELOPMENT IMPACTED TOWNS

PROJECT NUMBER:

CO-04-50431-00

PROJECT SUPERVISOR:

MITCHELL WENDELL
WENDELL ASSOCIATES
1432 LABURNUM STREET
MCLEAN, VA 22101

PRIMARY SPONSOR:

FEDERAL ENERGY ADMINISTRATION, OFFICE OF ENV. PROGRAMS
ELLEN S. BROWN
12TH & PENNSYLVANIA AVENUE, N.W.
WASHINGTON, DC 20461

PRIMARY FUNDING AMOUNT:

14,500

TIME FRAME:

10 20 75 TO 01 20 76

LOCATION:

NATIONWIDE

ABSTRACT:

IN THOSE STATES WHICH ARE UNDERGOING EXTENSIVE ENERGY RESOURCE DEVELOPMENT, THERE ARE A NUMBER OF SMALL TOWNS WHICH EXPECT TO EXPERIENCE RAPID GROWTH DIRECTLY RELATED TO THIS DEVELOPMENT. MANY OF THESE TOWNS ARE IN RURAL AREAS AND HAVE POPULATIONS OF LESS THAN 1,500.

THE INFRASTRUCTURE OF SUCH TOWNS IS NOT ABLE TO PROVIDE ADEQUATE SERVICES FOR RAPIDLY GROWING POPULATIONS. IT IS THE PURPOSE OF THIS STUDY TO THOROUGHLY ASSESS THE AVAILABILITY OF FEDERAL FUNDS FOR INFRASTRUCTURE BUILDING, AND EXPLORE THE MEANS FOR EXPEDITING DELIVERY OF THOSE FUNDS TO THE ENERGY DEVELOPMENT IMPACTED TOWN.

THE STUDY WILL IDENTIFY SOURCES OF FEDERAL ASSISTANCE TO LOCALITIES FOR INFRASTRUCTURE BUILDING. IT WILL PROVIDE A LEGAL ANALYSIS OF THE MANDATING LEGISLATION AND THE PERTINENT AGENCY REGULATIONS. BASED ON THIS ANALYSIS THE STUDY WILL EVALUATE THE POTENTIAL FOR EXPEDITING THE DISTRIBUTION OF THESE FUNDS TO ENERGY RESOURCE DEVELOPMENT IMPACTED COMMUNITIES.

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00000388

PROJECT TITLE:

COUNTY RESOURCE SERIES

PROJECT NUMBER:

CRS

INVESTIGATORS:

GARY B. GLASS; FORREST K. ROOT; ROY M. BRECKENRIDGE; WILLIAM G. WENDELL

PROJECT SUPERVISOR:

DANIEL N. MILLER, JR., STATE GEOLOGIST
WYOMING GEOLOGICAL SURVEY
BOX 3008, UNIV STATION
LARAMIE, WY 82071

PRIMARY SPONSOR:

WYOMING GEOLOGICAL SURVEY
DANIEL N. MILLER, JR.
BOX 3008, UNIV STATION
LARAMIE, WY 82071

PRIMARY FUNDING AMOUNT:

PUBLICATION COSTS AS REQUIRED

TIME FRAME:

01 01 71 TO CONTINUING

LOCATION:

WY - CONVERSE, CAMPBELL, SWEETWATER COUNTIES COMPLETED

ABSTRACT:

IN AN EFFORT TO KEEP PACE WITH RAPIDLY DEVELOPING NEEDS OF THE STATE, AND TO FORM A BASIS FOR PRIORITIES OF IMPORTANCE, THE GEOLOGICAL SURVEY HAS DEVELOPED THE COUNTY RESOURCE SERIES. BY MEANS OF MAPS, DIAGRAMS, AND TEXT, THE SERIES WILL ILLUSTRATE THE IMPORTANT GEOLOGICAL FEATURES AND MINERAL RESOURCES OF EACH OF WYOMING´S 23 COUNTIES. TO DATE, REPORTS ON THREE COUNTIES ARE COMPLETED.

THE SERIES IS DESIGNED TO CONVEY THE MAXIMUM OF PRACTICAL DETAIL FOR THE GREATEST NUMBER OF USERS. PREVIOUSLY PUBLISHED INFORMATION IS SUPPLEMENTED AND UPDATED WITH NEW AND CURRENT KNOWLEDGE TO PROVIDE A COMPLETE AND CONCISE PICTURE. THE WRITTEN TEXT IN EACH REPORT HAS BEEN KEPT TO A MINIMUM TO ENCOURAGE THE READER TO USE THE ORIGINAL REFERENCES AND TO ALLEVIATE UNNECESSARY DUPLICATION OF WORDS.

THE FOLLOWING SUBJECTS WILL NORMALLY BE INCLUDED IN EACH REPORT OF THE SERIES: PETROLEUM AND NATURAL GAS, COAL, URANIUM, ENVIRONMENTAL AND ENGINEERING GEOLOGY, LAND AND MINERAL OWNERSHIP, CONSTRUCTION MATERIALS, GEOLOGY, TOPOGRAPHY AND CLIMATE, AND WATER RESOURCES.

REPORTS AND PUBLICATIONS:

GEOLOGIC MAP ATLAS AND SUMMARY OF ECONOMIC MINERAL RESOURCES OF CONVERSE COUNTY, WYOMING; BY DONALD W. LANE, FORREST K. ROOT, AND GARY B. GLASS, CRS-1, 1972 WYOMING GEOLOGICAL SURVEY, BOX 3008, UNIVERSITY STATION, LARAMIE, WY 82071. PRICE $1.50.

GEOLOGIC MAP ATLAS AND SUMMARY OF ECONOMIC MINERAL RESOURCES OF SWEETWATER COUNTY, WYOMING; BY FORREST K. ROOT, GARY B. GLASS, AND DONALD W. LANE, CRS-2, 1973, WYOMING GEOLOGICAL SURVEY, BOX 3008, UNIVERSITY STATION,

LARAMIE, WY 82071, PRICE $3.00.
GEOLOGIC MAP ATLAS AND SUMMARY OF ECONOMIC MINERAL RESOURCES OF CAMPBELL COUNTY, WYOMING, BY ROY M. BRECKENRIDGE, ET AL., CRS-7, 1974, WYOMING GEOLOGICAL SURVEY, BOX 3008, UNIVERSITY STATION, LARAMIE, WY 82071, PRICE $3.00.

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00000369
PROJECT TITLE:
BRIDGING RESOURCE AND SOCIAL VARIABLES: A PROJECT TO LEARN HOW TO PLAN FOR AN MANAGE "PEOPLE PROBLEMS" ASSOCIATED WITH RESOURCE-RELATED DEVELOPMENT
PROJECT NUMBER:
COOPERATIVE AGREEMENT NO. 01-014
PROJECT SUPERVISOR:
RAYMOND L. GOLD, DIRECTOR
UNIV. OF MONTANA, INST. FOR SOCIAL SCI. RESEARCH
MISSOULA, MT 59801
COOPERATOR:
U.S. FOREST SERVICE, SURFACE ENVIRONMENT AND MINING
MONTANA DEPT. OF STATE LANDS
MONTANA DEPT. OF HEALTH & ENVIRONMENTAL SCIENCES
MONTANA DEPT. OF NATURAL RESOURCES & CONSERVATION
PRIMARY SPONSOR:
U.S. FOREST SERVICE, REGION I
JOHN D. HOLDEN, FOREST SERVICE COORDINATOR
MISSOULA, MT 59801
PRIMARY FUNDING AMOUNT:
18,000
TIME FRAME:
07 01 75 TO 06 30 76
LOCATION:
MT
ABSTRACT:

THE FOREST SERVICE IS CONCERNED WITH THE POTENTIAL FOR SOCIAL IMPACT UPON FOREST AND RANGELAND USERS AND ASSOCIATED COMMUNITIES IN THE STATE OF MONTANA AND THE NORTHERN REGION OF THE FOREST SERVICE AND THE WESTERN UNITED STATES FROM A VARIETY OF LAND USES SUCH AS MINERAL DEVELOPMENT, TIMBER HARVEST, WILDERNESS USE AND RECREATION. THERE ARE CURRENTLY VERY FEW VIABLE PROCESSES FOR ASSESSING AND TAKING INTO ACCOUNT SUCH IMPACT. THE UNIVERSITY IS CURRENTLY CONDUCTING STUDIES DESIGNED TO EVALUATE SOCIAL IMPACT METHODS, MAKE SOCIAL IMPACT ASSESSMENT, AND DETERMINE PRACTICAL APPLICATION TECHNIQUES FOR DECISION-MAKERS TO PROPERLY TAKE THEM INTO ACCOUNT. SINCE SEVERAL STATE AND FEDERAL AGENCIES ARE ALSO INTERESTED IN SOCIAL IMPACT ASSESSMENT AND APPLICATION PROCESSES AND METHODS, IT IS IN THEIR INTEREST TO WORK JOINTLY IN APPLYING SUCH METHODS AND PROCESSES.

OBJECTIVE : 1. TO UNDERSTAND SOCIAL SCIENCE PRINCIPLES WHICH PERTAIN TO THE BASIC VALUES AND VALUE CHANGES OF PEOPLE IN THIS PART OF THE U.S.A. 2. TO ACHIEVE A WORKING ABILITY TO APPLY BASIC SOCIAL SCIENCE PRINCIPLES TO THE WORK OF THE AGENCY. 3. TO RELATE THE SOCIAL TO THE PHYSICAL AND BIOLOGICAL. 4. TO DEVELOP AGENCY AND FUNCTIONARY ROLES FOR DEALING WITH THE SOCIAL. 5. TO FOSTER COORDINATION OF INTERAGENCY ROLES FOR DEALING WITH THE SOCIAL.

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00000370
PROJECT TITLE:
LABOR MARKET INFORMATION FOR EXPANDING ENERGY PRODUCTION IN THE ROCKY MOUNTAIN-NORTHERN GREAT PLAINS REGION
INVESTIGATORS:
GARTH L. MANGUM
UNIV. OF UTAH, HUMAN RESOURCE INST.
SALT LAKE CITY, UT 84112
R. THAYNE ROBSON
UNIV. OF UTAH, CENTER FOR ECON. & COMMUNITY DEV.
SALT LAKE CITY, UT 84112
PROJECT SUPERVISOR:
ROBERT J. BROWN
U.S. DEPT. OF LABOR, ETA
1961 STOUT ST.
DENVER, CO 80202
PRIMARY SPONSOR:
U.S. DEPT. OF LABOR, ETA
WILLIS J. NORDLUND
1961 STOUT ST.
DENVER, CO 80202
PRIMARY FUNDING AMOUNT:
50,000
TIME FRAME:
12 01 75 TO 11 30 76
LOCATION:
WY UT - ROCKY SPRINGS, WY; CARBON, EMERY, KANE COUNTIES, UT
ABSTRACT:

1. SURVEY THE LITERATURE RELATIVE: 1-PAST EXPERIENCE WITH RELATED NATURAL RESOURCE DEVELOPMENT. 2-METHODOLOGY FOR PROJECTING PRIMARY, SECONDARY, AND TERTIARY MANPOWER REQUIREMENTS FOR THE DEVELOPMENT OF ENERGY RESOURCES (COAL-FIRED POWER PLANTS, COAL GASIFICATION PROJECTS, OIL SHALE, COAL AND URANIUM) AND FOR THE NEW OR EXPANDED TOWNS WHICH SUPPORT THEM, 3-MIGRATORY PATTERNS RELATED TO MAJOR NATURAL RESOURCE DEVELOPMENTS.

2. MAKE CASE STUDIES OF THE MANPOWER DEVELOPMENTS OCCURRING IN: 1-ROCK SPRINGS, WYOMING, WHICH HAS ALREADY UNDERGONE A MAJOR ENERGY DEVELOPMENT WITHOUT

ADEQUATE PLANNING, 2-CARBON AND EMERY COUNTIES IN UTAH WHERE SIMILAR DEVELOPMENT IS JUST BEGINNING, AND 3-KANE COUNTY, UTAH, ENCOMPASSING THE KAIPAROWITS POWER PROJECT.
3. EXPLORE THE FEASIBILITY OF COLLECTING FROM ENGINEERING, CONSTRUCTION, MINING, AND UTILITY FIRMS INVOLVED SPECIFIC MANNING DATA ON THE CONSTRUCTION AND OPERATION OF MINES AND POWER PLANTS BY TYPE AND SIZE.
4. DEVELOP A REALISTIC PLAN FOR A LABOR MARKET INFORMATION SYSTEM TO BE IMPLEMENTED ON A PILOT EXPERIMENTAL AND DEMONSTRATION BASIS AS A SEPARATE FUTURE PROJECT.
5. EXPLORE THE FEASIBILITY OF THAT PLAN WITH REPRESENTATIVES OF THE REGIONAL MANPOWER ADMINISTRATION AND EACH EMPLOYMENT SERVICE ADMINISTRATION RESEARCH AND ANALYSIS UNIT AND EACH STATE MANPOWER OFFICE IN THE SIX STATES.
6. PROVIDE DATA AND INFORMATION ON A MONTHLY BASIS FOR USE IN A REGIONAL ENERGY NEWSLETTER.

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00000391
PROJECT TITLE:
ENERGY ALTERNATIVES: A COMPARATIVE ANALYSIS
PROJECT NUMBER:
E24AC034
INVESTIGATORS:
DON E. KASH;IRVIN L. (JACK) WHITE
PROJECT SUPERVISOR:
DON E. KASH
UNIV. OF OKLAHOMA, SCIENCE AND PUBLIC POLICY PROG.
601 ELM, ROOM 432
NORMAN, OK 73069
PRIMARY SPONSOR:
U.S. COUNCIL ON ENVIRONMENTAL QUALITY
MARVIN SINGER
722 JACKSON PLACE
WASHINGTON, DC 20006
PRIMARY FUNDING AMOUNT:
98,000
TIME FRAME:
07 01 74 TO 03 01 75
STATUS:
COMPLETED 03 01 75
ABSTRACT:
THIS REPORT HAS THREE PURPOSES: 1- TO PROVIDE DESCRIPTIONS OF ENERGY RESOURCE SYSTEMS, INCLUDING DESCRIPTIONS OF THE RESOURCE, DEVELOPMENT ACTIVITIES, AND APPLICABLE TECHNOLOGIES; 2- TO PROVIDE DATA ON RESIDUALS, ENERGY EFFICIENCIES, AND ECONOMIC COSTS FOR EACH ACTIVITY AND TECHNOLOGY IN EACH RESOURCE SYSTEM; 3- TO DESCRIBE AND DEMONSTRATE PROCEDURES FOR EVALUATING AND COMPARING ENERGY ALTERNATIVES ON THE BASIS OF RESIDUALS, ENERGY EFFICIENCIES, AND ECONOMIC COSTS, AND TO SUGGEST PROCEDURES FOR DETERMINING AND COMPARING LIKELY IMPACTS OF ENERGY ALTERNATIVES. THE REPORT IS DIVIDED INTO TWO MAJOR SECTIONS, THE FIRST BEING THE ENERGY RESOURCE SYSTEMS DESCRIPTIONS. THE SECOND SECTION DEMONSTRATES HOW TO EVALUATE AND COMPARE ENERGY ALTERNATIVES FOR THE PURPOSE OF PREPARING ENVIRONMENTAL IMPACT STATEMENTS. IN ADDITION TO DESCRIPTIONS OF ELEVEN ENERGY RESOURCE SYSTEMS, THERE ARE CHAPTERS ON ELECTRIC POWER GENERATION SYSTEMS AND ENERGY CONSUMPTION.
REPORTS AND PUBLICATIONS:
ENERGY ALTERNATIVES: A COMPARATIVE ANALYSIS SCIENCE AND PUBLIC POLICY PROGRAM, UNIVERSITY OF OKLAHOMA, MAY 1975. SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, DC 20402. PRICE $7.45. STOCK NUMBER: 041-011-00025-4

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00000392
PROJECT TITLE:
NATURAL RESOURCES INVENTORY
PROJECT NUMBER:
81-22-8
PROJECT SUPERVISOR:
ROBERT E. CARROLL
ECOLOGICAL CONSULTING SERVICE
1300 BLOCK CEDAR ST.
HELENA, MT 59601
PRIMARY SPONSOR:
U.S. BUREAU OF LAND MANAGEMENT, MONTANA STATE OFFICE
H. R. COSGRIFFE
FEDERAL BLDG.
BILLINGS, MT 59101
PRIMARY FUNDING AMOUNT:
32,000
TIME FRAME:
05 01 74 TO 12 31 74
STATUS:
COMPLETED 12 31 74
LOCATION:
MT - SOUTH ROSEBUD & COALWOOD PLANNING UNITS (3000 SQ. MILES)
ABSTRACT:
OBTAIN AND INTERPRET HIGH ALTITUDE 1:80,000 SCALE QUAD-CENTERED FALSE COLOR INFRARED AND OBTAIN GROUND TRUTH TO DELINEATE AND MAP: 1. VEGETATION HABITAT TYPES; 2. WILDLIFE HABITAT; 3. SCORIA (PORCELANITE); 4. EROSION SUSCEPTIBILITY; 5. EROSION CLASS & CONDITION; 6. RANGE CONDITON; 7. CURRENT LAND USE.
REPORTS AND PUBLICATIONS:
REPORT TO BUREAU OF LAND MANAGEMENT - BILLINGS, MT

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00000393
PROJECT TITLE:
   VEGETATION TYPING AND MAPPING
PROJECT NUMBER:
   120-23-A
PROJECT SUPERVISOR:
   ROBERT E. CARROLL
   ECOLOGICAL CONSULTING SERVICE
   1100 BLOCK CEDAR ST.
   HELENA, MT  59601
PRIMARY SPONSOR:
   PETER KIEWIT SONS
   SAM SCOTT
   SHERIDAN, WY
PRIMARY FUNDING AMOUNT:
   PROPRIETARY
TIME FRAME:
   07 01 75 TO 11 30 75
STATUS:
   COMPLETED 11 30 75
LOCATION:
   WY  -  BLACK BUTTE VICINITY (200 SQ. MILES)
ABSTRACT:
   VEGETATION TYPING AND MAPPING OF 200 SQUARE MILES BY
   FALSE-COLOR INFRARED AERIAL PHOTO INTERPRETATION AND
   QUANTITATIVE GROUND TRUTH.
REPORTS AND PUBLICATIONS:
   NOV. 1975 REPORT TO PETER KIEWIT & SONS, SHERIDAN, WYO.
```

LOCATION INDEX

LOCATION INDEX

AZ

00000317 00000384

CA

00000351

CO

00000316 00000337 00000384

*GX

00000303 00000307 00000318 00000365 00000366 00000368 00000369 00000371 00000372 00000373 00000374
00000375 00000376 00000379 00000380 00000384 00000387 00000391

MN

00000351

MT

00000301 00000302 00000303 00000309 00000310 00000311 00000312 00000313 00000314 00000315 00000322
00000323 00000324 00000325 00000326 00000327 00000328 00000329 00000330 00000331 00000332 00000333
00000337 00000338 00000340 00000341 00000342 00000343 00000344 00000345 00000346 00000347 00000348
00000349 00000350 00000353 00000354 00000355 00000356 00000357 00000358 00000360 00000363 00000364
00000365 00000366 00000367 00000368 00000369 00000370 00000371 00000372 00000373 00000374 00000375
00000376 00000377 00000381 00000382 00000385 00000389 00000392 00000308

ND

00000335 00000336 00000337 00000338 00000352 00000356 00000358 00000362 00000363 00000364 00000378
00000384 00000308

NE

00000358 00000364

NM

00000337

SD

00000334 00000337 00000358 00000359 00000364 00000383

UT

00000337 00000390

WI

00000351

WY

00000301 00000302 00000304 00000305 00000306 00000319 00000320 00000321 00000325 00000334 00000337
00000338 00000339 00000356 00000358 00000361 00000363 00000364 00000386 00000388 00000390 00000393

*GX SIGNIFIES PROJECTS OF GENERAL APPLICABILITY NOT GEOGRAPHICALLY BOUND TO A STATE

PERSONAL NAME INDEX

NAME INDEX

ANDERSON, C. R. 00000331

ANDERSON, J. 00000303

BARBAROSSA, N. L. 00000338 00000363

BARRINGER, J. 00000360

BARTZ, D. 00000351

BECKNER, J. 00000354

BEEZHOLD, W. 00000303

BENDER, L. D. 00000358

BERG, L. 00000376 00000377

BJUGSTAD, A. J. 00000319

BREALEY, S. 00000380

BRECKENRIDGE, R. M. 00000388

BRELSFORD, D. 00000385

BROWN, E. S. 00000387

BROWN, R. J. 00000390

CALLAGHEN, D. 00000379

NAME INDEX

CAMERON, R. E.
00000339

CARROLL, R. E.
00000331 00000353 00000354 00000362 00000385 00000392 00000393

CARTER, R. P.
00000339

CHADWICK, R. A.
00000303 00000342 00000381 00000382

CHALMERS, J. A.
00000360

COLAIZZI, G. J.
00000379

CONE, R.
00000303

COOK, F.
00000307

CORRIGALL, K. H.
00000338

COSGRIFFE, H. R.
00000392

CROFT, M. G.
00000336

DEGN, A. M.
00000349

DEL FUOCO, G.
00000359 00000361

DEPUIT, E. J.
00000309 00000310

DOLLHOPF, D. J.
00000313 00000314

DONNER, D. L.
00000340

DOWNEY, J. S.
00000335

NAME INDEX

DREW, L. A. 00000310

DURNFORD, R. 00000374

ELLENBECKER, J. 00000383

EMERSON, K. 00000348

ENG, R. 00000344

EVERSMAN, S. 00000347

FINNERTY, L. 00000359

FOGEL, M. M. 00000317

FRANKLIN, R. E. 00000339

GARTNER, A. 00000333

GENETTI, W. E. 00000367

GLASSGOW, E. 00000334

GLASS, G. B. 00000304 00000305 00000306 00000388

GOLD, R. L. 00000389

GOODIER, J. T. 00000305

GORS, M. 00000334

GREGORY, R. W. 00000332 00000344

NAME INDEX

HADLEY, R. F. 00000337
HARLOW, C. 00000337
HEDEGAARD, M. T. 00000349
HEIMBACH, JR., J. A. 00000345 00000348
HERSMANN, L. F. 00000339
HODDER, R. L. 00000308 00000309 00000310 00000311 00000313 00000314 00000340 00000341
HOLDEN, J. D. 00000389
HOWARD, G. S. 00000320 00000321
HULL, R. 00000337
IMHOFF, E. A. 00000346
IRION, F. 00000333
JACQUOT, N. F. 00000357
JELINEK, D. 00000360
JENNINGS, P. W. 00000326
JENSEN, I. B. 00000308
JOBES, P. C. 00000303 00000357
JOHNSON, R. 00000369

NAME INDEX

JUDY, C. 00000333

KASH, D. E. 00000391

KNAPP, J. W. 00000363

KUCHENBECKER, K. 00000334

KUJAWA, S. T. 00000377

KUNTZ, W. 00000318

LABRIE, R. J. 00000350

LACHAPELLE, D. G. 00000351

LAFEVERS, J. 00000384

LANE, D. W. 00000388

LANE, J. 00000361

LANG, R. 00000320

LAPEYRE, G. 00000303 00000368

LAWLER, J. K. 00000386

LELAND, E. 00000356

LINDQUIST V. 00000359

LINDSAY, L. H. 00000352

NAME INDEX

LUSBY, G. C.
00000337

MADSEN, R. H.
00000338 00000363

MALONEY, K. L.
00000351

MANGUM, G. L.
00000390

MARCUS, P.
00000318

MARTIN, D.
00000362

MATSON, R. E.
00000301 00000302

MATTHEW, F.
00000334

MCBRIDE, J.
00000343

MCCANDLESS, F. P.
00000365 00000366 00000375 00000376

MCINTOSH, G. E.
00000317

MCNAY, L. M.
00000307

MCPARTLAND, J.
00000345

MEYN, R. L.
00000311

MILLER, JR., D. N.
00000398

MILLER, W. L.
00000395

MOORE, R.
00000344

MUNSHOWER, F. F. 00000340 00000341

MUSSULMAN, R. L. 00000367

NEAL, D. M. 00000378

NEWPORT, B. 00000316

NORDLUND, W. J. 00000390

ORR, H. K. 00000319

PAGENKOPF, G. K. 00000315 00000326

PARSONS, H. 00000312

PARSONS, M. G. 00000357

PATTERSON, D. W. 00000355 00000356

PAYNE, G. F. 00000343

PHILLIPS, R. L. 00000310

PICTON, H. 00000344

PIERRE, D. 00000372

POLETTE, D. 00000303

RACINE, J. 00000385

RAUZI, F. 00000320 00000321

REIHMAN, T. C. 00000371

ROOT, F. K. 00000389

SCHELL, E. M. 00000305

SCHILLER, J. E. 00000379

SCHMIDT, V. H. 00000303 00000370

SCHUMAN, G. E. 00000320 00000321

SCOTT, S. 00000393

SCOTT, W. R. 00000335 00000336

SELLE, S. J. 00000352

SEMPLE, W. 00000303

SHORE, P. H. 00000338

SILVERMAN, A. J. 00000343

SIMON, R. 00000361

SIMPSON, D. 00000353 00000360

SINGER, M. 00000391

SMITH, O. 00000309

SONDREAL, E. A. 00000352 00000379

STEPHENS, W. E. 00000349

STEWART, R. C. 00000309

STROUP, R. L. 00000330 00000364

STRUHSACKER, E. M. 00000382

SUPER, A. B. 00000345 00000346

SWANSON, V. 00000306

TAYLOR, J. E. 00000343

TEMPLE, K. L. 00000309

THAMES, J. L. 00000317

THURMAN, W. 00000364

TOWNES, H. W. 00000371

TUFTE, P. H. 00000352

UHLMANN, J. M. 00000361

VAN VOAST, W. A. 00000308 00000322 00000323 00000324 00000325 00000326 00000327 00000328 00000329

VERMA, T. R. 00000317

VINIKOUR, W. S. 00000339

WENDELL, M. 00000387

WENDELL, W. S.
00000388

WEST, S. W.
00000305

WHITE, I. L.
00000391

WHITE, JR., D. M.
00000304 00000306

WILLIAMS, A. S.
00000355 00000356

WOODRIFF, R. A.
00000303 00000342 00000373

ORGANIZATION INDEX

ORGANIZATION INDEX

AMAX COAL CO.
00000344 00000348

ARCHES MINERAL
00000308

ARIZONA STATE UNIV., DEPT. OF ECONOMICS
00000360

AVCO EVERETT RESEARCH LAB.
00000377

BECHTEL CORP.
00000350

BLACK HILLS CONSERVANCY SUB-DISTRICT
00000334

CHEVRON OIL CO.
00000309 00000310

COLORADO SCHOOL OF MINES, RESEARCH INSTITUTE
00000316

COMBUSTION EQUIPMENT ASSOCIATES
00000350

CONSOLIDATED ENGINEERING
00000334

CROW TRIBE
00000329 00000369

DECKER COAL CO.
00000313 00000323 00000332

ECOLOGICAL CONSULTING SERVICE
00000331 00000353 00000354 00000362 00000385 00000392 00000393

GILLETTE-CAMPBELL CO. CITY-COUNTY PLANNING DEPT.
00000386

HARZA ENGINEERING CO.
00000363

HRB SINGER
00000318

KNIFE RIVER COAL CO.
00000305

ORGANIZATION INDEX

KVB, INC.
00000351

MATHEMATICA, INC.
00000307

MISSOURI RIVER BASIN COMMISSION
00000335 00000367

MOHL DRILLING
00000301

MONTANA BUREAU OF MINES & GEOLOGY
00000301 [illegible] 00000315 00000322 00000323 00000324 00000325 00000326 00000327 00000328 00000329

MONTANA COLLEGE OF MINERAL SCIENCES AND TECHNOLOGY
00000364 00000365 00000367 00000368 00000369 00000370 00000371 00000372 00000373 00000374

MONTANA COLLEGE OF MINERAL SCIENCES TECHNOLOGY FOUNDATION
00000366

MONTANA DEPT. OF FISH AND GAME
00000330 00000332 00000344

MONTANA DEPT. OF HEALTH & ENVIRONMENTAL SCIENCES
00000332 00000344 00000359

MONTANA DEPT. OF NATURAL RESOURCES & CONSERVATION
00000330 00000359

MONTANA DEPT. OF SOCIAL & REHABILITATION SERVICES
00000355

MONTANA DEPT. OF STATE LANDS
00000359

MONTANA ENERGY ADVISORY COUNCIL
00000357

MONTANA ENERGY & MHD RESEARCH & DEVELOPMENT INST.
00000365 00000366 00000367 00000368 00000369 00000370 00000371 00000372 00000373 00000374

MONTANA POWER CO.
00000331 00000340 00000342 00000345 00000346 00000350 00000351

MONTANA STATE UNIV.
00000324 00000332 00000346 00000377

MONTANA STATE UNIV., AG. EXP. STATION
00000304 00000310 00000313 00000314 00000343 00000354

MONTANA STATE UNIV., BIOLOGY DEPT.
00000344 00000347

MONTANA STATE UNIV., CHEMISTRY DEPT.
00000342

MONTANA STATE UNIV., COLLEGE OF GRADUATE STUDIES
00000312

MONTANA STATE UNIV., DEPT. OF AG. ECONOMICS & ECONOMICS
00000330 00000358 00000364

MONTANA STATE UNIV., DEPT. OF ANIMAL & RANGE SCIENCES
00000309 00000311 00000341 00000343

MONTANA STATE UNIV., DEPT. OF CHEMICAL ENG.
00000365 00000366 00000367 00000375 00000376 00000377

MONTANA STATE UNIV., DEPT. OF CHEMISTRY
00000315 00000373

MONTANA STATE UNIV., DEPT. OF EARTH SCIENCES
00000342 00000345 00000348 00000381 00000382

MONTANA STATE UNIV., DEPT. OF ELECTRICAL ENG.
00000369 00000372 00000374

MONTANA STATE UNIV., DEPT. OF MECHANICAL ENG.
00000367 00000371

MONTANA STATE UNIV., DEPT. OF MICROBIOLOGY
00000309

MONTANA STATE UNIV., DEPT. OF PHYSICS
00000303 00000368 00000370

MONTANA STATE UNIV., DEPT. OF SOCIOLOGY
00000357

MONTANA STATE UNIV., INSTITUTE OF APPLIED RESEARCH
00000356 00000355

MONTANA STATE UNIV., WATER RESOURCES RESEARCH CENTER
00000322 00000330

MOUNTAIN WEST RESEARCH, INC.
00000360

ORGANIZATION INDEX

NATIONAL INST. OF MENTAL HEALTH
00000361

NATIONAL SCIENCE FOUNDATION
00000307 00000312 00000375

NATIONAL SCIENCE FOUNDATION, RANN
00000347 00000364

NORTH AMERICAN COAL CO.
00000309

NORTHEAST SOUTH DAKOTA COMMUNITY ACTION PROGRAM
00000387

NORTHERN GREAT PLAINS RESOURCES PROGRAM
00000325 00000356

OELINGER-SMITH CORP.
00000356

PACIFIC POWER & LIGHT
00000308

PD-NCB
00000350

PEABODY COAL CO.
00000314 00000329 00000334

PETER KIEWIT SONS
00000347

PUGET SOUND POWER AND LIGHT
00000331 00000340 00000346

SHELL OIL CO.
00000329

SOUTH DAKOTA DEPT. OF LABOR
00000383

SOUTH DAKOTA DEPT. OF TOURISM & INDUSTRIAL DEVELOPMENT
00000359

SOUTH DAKOTA ENERGY POLICY OFFICE
00000334

SOUTH DAKOTA SCHOOL OF MINES & TECH., FOREST RESEARCH LAB.
00000319

SOUTH DAKOTA SIXTH DISTRICT COUNCIL OF LOCAL GOVERNMENTS
00000359

THEODORE BARRY & ASSOCIATES
00000379

UNIV. OF ARIZONA
00000317

UNIV. OF MONTANA
00000341 00000343 00000364

UNIV. OF MONTANA, INST. FOR SOCIAL SCI. RESEARCH
00000389

UNIV. OF OKLAHOMA, SCIENCE AND PUBLIC POLICY PROG.
00000391

UNIV. OF UTAH, CENTER OF ECON. & COMMUNITY DEV.
00000390

UNIV. OF UTAH, HUMAN RESOURCES INST.
00000390

UNIV. OF WYOMING
00000361

U.S. AG. RESEARCH SERVICE
00000320 00000321

U.S. BUREAU OF INDIAN AFFAIRS, PLANNING SUPPORT GROUP
00000349

U.S. BUREAU OF LAND MANAGEMENT
00000335 00000336 00000337

U.S. BUREAU OF LAND MANAGEMENT, MONTANA STATE OFFICE
00000362 00000392

U.S. BUREAU OF MINES, DENVER MIN. RESEARCH CENTER
00000317 00000379 00000380

U.S. BUREAU OF MINES, DIV. OF ENVIRONMENT
00000318

U.S. BUREAU OF MINES, IFOC
00000304 00000304

U.S. BUREAU OF MINES, SPOKANE MINING RESEARCH CENTER
00000307

U.S. BUREAU OF RECLAMATION
00000356

ORGANIZATION INDEX

U.S. COUNCIL ON ENVIRONMENTAL QUALITY
00000391

U.S. DEPT. OF AG., ECONOMIC RESEARCH SERVICE
00000354

U.S. DEPT. OF COMMERCE, ECONOMIC DEVELOPMENT ADMIN.
00000358 00000361

U.S. DEPT. OF H.E.W., COMMUNITY SERVICES ADMINISTRATION
[illegible]

U.S. DEPT. OF INTERIOR
00000349

U.S. DEPT. OF INTERIOR, OFFICE OF WATER RESEARCH & TECH.
00000315

U.S. DEPT. OF LABOR, ETA
00000350

U.S. EPA
00000305 00000326 00000332 00000333 00000351

U.S. EPA, CORVALLIS NAT. ENV. RESEARCH CENTER
00000347

U.S. EPA, REGION VIII
00000315

U.S. EPA, ROBT. S. KERR ENVIRONMENTAL RESEARCH LAB.
00000316

U.S. ERDA
00000341 00000352 00000365 00000366 00000367 00000368 00000369 00000370 00000371 00000372 00000373
00000376 00000379

U.S. ERDA, AMES LAB.
00000341

U.S. ERDA, ARGONNE NATIONAL LAB., ENERGY & ENV. SYSTEMS DIV.
00000339

U.S. ERDA, BATTELLE PACIFIC NW LAB.
00000341

U.S. ERDA, DIV. OF BIOMEDICAL & ENV. RESEARCH
00000339

U.S. ERDA, GRAND FORKS ENERGY RESEARCH CENTER
[illegible] [illegible]

U.S. FEDERAL ENERGY ADMINISTRATION
00000334

U.S. FEDERAL ENERGY ADMINISTRATION, OFFICE OF ENV. PROGRAMS
00000387

U.S. FISH & WILDLIFE SERV.
00000310 00000332 00000344

U.S. FOREST SERVICE, SURFACE ENVIRONMENT AND MINING
00000319 00000389

U.S. GEOLOGICAL SURVEY
00000315 00000327

U.S. GEOLOGICAL SURVEY, BRANCH OF COAL RESOURCES
00000306

U.S. GEOLOGICAL SURVEY, CONSERVATION DIV.
00000301 00000302 00000305

U.S. GEOLOGICAL SURVEY, RESOURCE & LAND INVESTIGATIONS
00000384

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIV.
00000305 00000335 00000336 00000337 00000382

U.S. WATER RESOURCES COUNCIL
00000338 00000363

WENDELL ASSOCIATES
00000387

WEST RIVER CONSERVANCY SUB-DISTRICT
00000334

WESTERN ENERGY CO.
00000308 00000311 00000324 00000342

WESTMORELAND RESOURCES
00000344 00000349 00000353 00000360

WYOMING DEPT. OF ECONOMIC PLANNING & DEVELOPMENT
00000306

WYOMING DEPT. OF PUBLIC ASSISTANCE & SOCIAL SERVICES
00000361

WYOMING GEOLOGICAL SURVEY
00000358

YELLOWSTONE-TONGUE APO
L0000737

SUBJECT INDEX

SUBJECT INDEX

ADAPTATION
00000320

AERIAL PHOTOGRAPHY
00000304 00000318 00000362 00000392 00000393

AIR POLLUTION
00000312 00000342 00000345 00000346 00000347 00000348 00000350 00000351 00000352

AIR QUALITY
00000310 00000351 00000363

ALTERNATE ENERGY
00000382

ALTERNATIVE STUDIES
00000334 00000338 00000360 00000363 00000384 00000391

AMENITY VALUES
00000330

ANIMAL PHYSIOLOGY
00000340 00000344

AQUATIC ECOSYSTEMS
00000339

AQUATIC ENVIRONMENT
00000331 00000332 00000344

AQUEDUCTS
00000334

AQUIFERS
00000308 00000327 00000336

ARCHAEOLOGICAL SITES
00000362

ARID CLIMATES
00000317

ARTESIAN WELLS
00000324

ASH FUSION TEMPERATURES
00000306

SUBJECT INDEX

ASTM DISTILLATION
00000734

ATOMIC SPECTROSCOPY
00000742

ATTITUDE SURVEYS
00000736 00000757 00000760

BASELINE DATA
00000707 00000715 00000727 00000728 00000729 00000733 00000735 00000737 00000740 00000742 00000743
00000747 00000748 00000753 00000754 00000762 00000766

BEADLE CO., SD
00000753

BELLE AYR SOUTH MINE
00000719

BENTHIC INVERTEBRATES
00000731

BEULAH, ND
00000705

BIG SKY MINE
00000728 00000754

BIGHORN CO., MT
00000701 00000749 00000753 00000756 00000757 00000760

BIGHORN MINE
00000739

BIOENVIRONMENT
00000735 00000740 00000741 00000743 00000744

BIRDS
00000744

BIRNEY, MT
00000757

BLACK BUTTE, WY
00000753

BLACK MESA MINE
00000717

BOILERS
00000751

SUBJECT INDEX

BOOM TOWNS
00000386 00000387 00000390

BOWMAN CO., ND
00000336

BRIDGER RANGE, MT
00000381

CALCUIM CHLORIDE
00000313

CAMPBELL CO., WY
00000301 00000356 00000361 00000386 00000388

CARBON CO., UT
00000390

CARBON CO., WY
00000304 00000305 00000306

CARTER CO., MT
00000333

CATALYTIC MATERIALS
00000375 00000376

CENTRAL HIGH PLAINS
00000320

CHANNEL SAMPLES
00000302

CHEMICAL ANALYSIS
00000322

CHEMICAL PROPERTIES
00000306 00000315 00000340

CLIMATOLOGY
00000348 00000388

COAL
SEE CHAPTER 1.0 AND:
00000390 00000392 00000393

SUBJECT INDEX

COAL EXPLORATION
00000301

COAL EXTRACTION
00000379 00000380

COAL HYDROGENATION
00000375 00000377

COAL OUTCROP MAPS
00000304

CODY VS. MORTON
0000034

COED PROCESS
00000376

COLOR INFRARED PHOTOGRAPHY
00000315

COLSTRIP UNITS 1 & 2
00000341 00000347

COLSTRIP UNITS 3 & 4
00000355

COLSTRIP, MT
00000305 00000311 00000315 00000341 00000342 00000345 00000346 00000347 00000350 00000355 00000377

CONSTRUCTION MATERIALS
00000315

CONSTRUCTION PROJECTS
00000355 00000390

CONTOUR MAPPING
00000305

CONVERSE CO., WY
00000306 00000339 00000361 00000363 00000365

COPPER
00000314

CORE DRILLING
00000305

CORE LOGGING
00000305

CORWIN SPRINGS, MT
00000382

COST EFFECTIVENESS
00000318 00000351

COSTEAM PROCESS
00000378

COUNTY RESOURCE SERIES
00000388

CRAZY MOUNTAINS BASIN, MT
00000381

CRESAP PROCESS
00000376

CROOK CO., WY
00000338 00000363

CROW INDIAN RESERVATION
00000329 00000349 00000360

CROW TRIBE
00000349

CULTURAL RESOURCES
00000362

CUSTER CO., MT
00000333 00000360

CUSTER NATIONAL FOREST
00000347

DATA COLLECTION
00000335

DAWSON CO., MT
00000301

DECKER MINE
00000332

DECKER, MT
00000315 00000323 00000357

DEMOGRAPHY
00000360

DIFFUSION MODELS
00000745 00000746

DIPPING COAL DEPOSITS
00000750

DISPERSION
00000745

DISTILLATE FUELS
00000776

DRILL CORE ANALYSIS
00000701 00000705

DUNN CO., ND
00000735 00000742

ECONOMIC ANALYSIS
00000759 00000747 00000756

ECONOMIC DEVELOPMENT
00000755 00000756

ECONOMIC DIVERSIFICATION
00000759

ECONOMIC IMPACT
00000756

ECONOMICS
00000746 00000790

ECOSYSTEM CLASSIFICATION
00000743 00000744

EDMUNDS CO., SD
00000787

ELECTRIC POWERPLANTS
00000740 00000741 00000742 00000743 00000745 00000746 00000747 00000750 00000751 00000767 00000790
00000791

ELECTROSTATIC PRECIPITATION
00000752

EMERGENCY ENERGY CONSERVATION PROJECT
00000767

EMERY CO., UT
00000750

SUBJECT INDEX

EMRIA
00000335 00000336 00000337

ENERGY CONSERVATION
00000303 00000387

ENERGY CONSUMPTION
00000351 00000391

ENERGY CONVERSION
SEE CHAPTER 1.6 AND:
00000330

ENERGY DEVELOPMENT
00000303 00000334 00000343 00000359 00000361 00000362 00000363 00000385 00000386 00000387 00000389
00000390 00000391

ENERGY RESOURCE SYSTEMS
00000391

ENERGY SUPPLY & DEMAND
00000363

ENVIRONMENTAL IMPACT
00000310 00000312 00000337 00000341 00000342 00000363 00000369

ENVIRONMENTAL IMPACT STATEMENTS
00000349 00000391

EROSION
00000309 00000321 00000337 00000392

EVAPOTRANSPIRATION
00000305

FALLON CO., MT
00000333

FALSE COLOR INFRARED PHOTOGRAPHY
00000315 00000362 00000365 00000392 00000393

FAULK CO., SD
00000383

FERTILIZERS
00000321 00000365 00000366

FISH POPULATIONS
00000344

FISHERIES STUDIES
00000332

SUBJECT INDEX

FLY ASH
00000752

FORECASTING
00000704 00000716 00000735 00000736 00000363 00000764

FOREST ECOSYSTEMS
00000341

FOREST RESOURCES
00000759 00000389

FREE-SWELLING INDICES
00000706

FUELS
00000776 00000778

GARDINER, MT
00000752

GARFIELD CO., MT
00000735 00000767

GASCOYNE, ND
00000736

GASIFICATION
00000764 00000775 00000740

GEOCHEMICAL SURVEYS
00000707 00000735

GEOLOGIC INVESTIGATIONS
00000707 00000708 00000727 00000741 00000742 00000748

GEOTHERMAL
00000707 0000074[illegible]

GILLETTE, WY
00000734 00000741 00000746

GLASGOW AIR FORCE BASE
00000745

GLASGOW ENERGY PARK
00000745

GLASGOW, MT
00000745

SUBJECT INDEX

GOVERNMENT FINANCES
00000386

GOVERNMENT INFRASTRUCTURE
00000358 00000360 00000386 00000387

GOVERNMENT SERVICES
00000387

GRADUATE TRAINEESHIP PROGRAM
00000312

GREENHOUSE STOCK
00000319

GROUNDWATER
00000315 00000316 00000323 00000325 00000326 00000333 00000335 00000336

GROWTH MANAGEMENT
00000386

GYPSUM
00000313

HAND CO., SD
00000383

HANNA COAL FIELD
00000304 00000305

HANNA, WY
00000304 00000305

HARDGROVE GRINDABILITY INDICES
00000306

HIGHWALL REDUCTION
00000380

HOME WINTERIZATION
00000383

HOT SPRINGS
00000382

HUMAN SERVICES
00000361

HYDROLOGY
00000317 00000322 00000323 00000324 00000325 00000327 00000328 00000329 00000335 00000336 00000337
00000339 00000382

SUBJECT INDEX

H-OIL PROCESS
00000776

INDICATOR SPECIES
00000747

INDUSTRIAL ENERGY CONSUMPTION
00000751

INDUSTRIAL WATER
00000774

INFORMATION SYSTEMS
00000790

INFRARED PHOTOGRAPHY
00000762 00000785 00000792 00000797

INTRODUCED SPECIES
00000719 00000720 00000721

IRRIGATION
00000719 00000739

JOHNSON CO., WY
00000761

KAIPAROWITS POWER PROJECT
00000790

KANE CO., UT
00000790

LABOR MARKET INFORMATION
00000790

LAND OWNERSHIP
00000788

LAND RECLAMATION PROGRAM
00000739

LAND USE
00000733 00000737 00000747 00000757 00000784 00000785 00000786 00000788 00000392

LAND USE MAPPING
00000755

LARGE MAMMALS
00000744

SUBJECT INDEX

LASERS 00000303

LEACHING 00000315 00000316

LEGAL ASPECTS 00000318 00000387

LEVEL B ANALYSIS 00000338 00000363

LICHENS 00000347

LIGNITE 00000336 00000384

LIMNOLOGY 00000332

LINCOLN CO., WY 00000306

LIQUEFACTION 00000375 00000376 00000377 00000378

LIQUID FUELS 00000378

MAGNETOHYDRODYNAMIC GENERATORS 00000366 00000367 00000368 00000370 00000371 00000374

MAGNETOHYDRODYNAMICS 00000365 00000366 00000367 00000368 00000369 00000370 00000371 00000372 00000373 00000374

MANAGEMENT 00000343

MANPOWER REQUIREMENTS 00000390

MAPPING 00000304 00000333 00000344 00000347 00000381 00000382 00000385 00000388 00000392 00000393

MARSHALL CO., SD 00000383

MCCONE CO., MT 00000338 00000363

MCKAY COAL SEAM
00000342

MCLEAN CO., ND
00000338 00000363

MCPHERSON CO., SD
00000363

MERCER CO., ND
00000356 00000362

METEOROLOGICAL DATA
00000309 00000346 00000348

MHD
00000365 00000366 00000367 00000368 00000369 00000370 00000371 00000372 00000373 00000374

MHD CYCLE ANALYSIS
00000372

MHD INSTRUMENTATION
00000366 00000367 00000368 00000369 00000370 00000372 00000374

MHD INVERTERS
00000374

MHD STEAM PLANTS
00000369

MICROBIOLOGY
00000309

MINE HAULAGE
00000310 00000379 00000380

MINE SAMPLING
00000302

MINERAL DEVELOPMENT
00000389

MINERAL OWNERSHIP
00000388

MINERAL RESOURCES
00000388

MINING EQUIPMENT
00000379 00000380

MINING METHODOLOGY
00000307 00000326 00000379 00000380

MINING SYSTEMS
00000380

MISSOURI RIVER BASIN
00000334 00000338 00000363

MISSOURI RIVER-WYOMING AQUEDUCT
00000334

MODELS
00000313 00000314 00000326 00000335 00000336 00000345 00000360 00000363

MODERATE TEMPERATURE SLAG FLOW FACILITY
00000371

MONITORING
00000305 00000308 00000309 00000310 00000318 00000322 00000323 00000324 00000327 00000329 00000332
00000345 00000348 00000353 00000354

MONTANA STRIP MINING AND RECLAMATION ACT OF 1973
00000312

MORPHOMETRY
00000332 00000344

MTSFF
00000371

MULCHES
00000321

MULTIDISCIPLINARY TEAMS
00000361

MUSSELSHELL CO., MT
00000338 00000363

NATRONA CO., WY
00000338 00000363

NATURAL GAS
00000364 00000381 00000388

NATURAL RESOURCES INVENTORY
00000392

NEUTRON PROBE TECHNIQUES
00000313 00000314

SUBJECT INDEX

NIOBRARA CO., WY
00000735 00000767

NITRIC OXIDE
00000765 00000766

NITROGEN OXIDE CONCENTRATIONS
00000771

NORTHERN CHEYENNE INDIAN RESERVATION
00000733

NORTHERN GREAT PLAINS
00000715 00000764 00000790

OAHE RESERVOIR
00000734

OILSHALE
00000790

OLIVER CO., ND
00000756 00000762

OPPORTUNITY COSTS
00000730

OVERBURDEN
00000704 00000707 00000710 00000716 00000721 00000734 00000779 00000790

OVERBURDEN CHARACTERISTICS
00000710

OVERBURDEN HANDLING
00000707 00000779

OVERBURDEN MAPS
00000704

PAMCO PROCESS
00000776

PETROLEUM
00000788

PETROLOGY
00000781

PHENOLOGY
00000741

SUBJECT INDEX

PHOTOELECTRIC EMISSIONS
00000303

PHOTOINTERPRETATION
00000362

PHYSIOCHEMICAL PROPERTIES
00000306

PLANNING
00000307 00000318 00000326 00000330 00000333 00000343 00000349 00000379 00000386 00000390

PLANT ECOLOGY
00000341

PLANT ESTABLISHMENT
00000312 00000319 00000320 00000321

PLANT MATERIALS
00000320 00000321

PLANT PHYSIOLOGY
00000320 00000340 00000341 00000347

PLATTE CO., WY
00000361

PLUMES
00000345 00000346

POLICY DEVELOPMENT
00000355 00000356

POPULATION GROWTH
00000343 00000355 00000358 00000386 00000387

POPULATION PROJECTIONS
00000355 00000390

POWDER RIVER BASIN
00000325

POWDER RIVER CO., MT
00000333 00000357 00000360

PREMINING STUDIES
00000312 00000319 00000329

PUBLIC FINANCE
00000360

PUBLIC SERVICES
00000355 00000356 00000360

PUBLICATIONS
00000388 00000390

RAILROAD SPUR LINE
00000310

RAINFALL SIMULATOR
00000337

RALI
00000384

RANGE ECOLOGY
00000313 00000314

RANGE PLANTS
00000340

RANGE RESOURCES
00000389 00000392

RANGELAND ECOSYSTEMS
00000340 00000341

RECLAMATION
SEE CHAPTER 1.2 AND:
00000324 00000326 00000335 00000337 00000363 00000379 00000380 00000384

RECLAMATION STANDARDS
00000312

RECREATION
00000330 00000338 00000343 00000344 00000389

REDUCING AGENTS
00000377

REGULATIONS
00000387

RESOURCE INVENTORY
00000304 00000388 00000392

RETREAT SURFACE MINING SYSTEMS
00000380

REVEGETATION
00000308 00000311 00000320 00000321

REVENUE ALLOCATIONS
00000356 00000358 00000360 00000387

RICHLAND CO., MT
00000301 00000338 00000363

ROBERTS CO., SD
00000383

ROCK SPRINGS, WY
00000390

ROSEBUD COAL SEAM
00000340 00000342

ROSEBUD CO., MT
00000333 00000354 00000355 00000356 00000357 00000360

ROSEBUD CREEK, MT
00000331

RUNOFF
00000308 00000321 00000336 00000337

RURAL DEVELOPMENT
00000358 00000387

SALINE-ALKALI SPOILS
00000313 00000315

SAMPLING PROCEDURES
00000306

SANDSTONES
00000381

SARPY CREEK, MT
00000344 00000353

SAVAGE, MT
00000308

SCRUBBERS
00000350

SEDIMENTATION
00000308 00000336 00000337

SEDIMENTOLOGY
00000381

SUBJECT INDEX

SEEPAGE
00000332

SERVICE SECTOR
00000355 00000356 00000358 00000360

SEWAGE TREATMENT
00000333

SHERIDAN CO., WY
00000301 00000306 00000339 00000356

SIMULATION MODELS
00000326

SITING STUDIES
00000363 00000369

SLAG FLOW CHARACTERISTICS
00000371

SLAG-SEED PROPERTIES
00000368 00000370 00000373

SMALL MAMMALS
00000344

SOCIAL IMPACT ASSESSMENT
00000389

SOCIOECONOMIC IMPACT
SEE CHAPTER 1.5 AND:
00000303 00000330 00000363 00000369 00000386 00000387 00000389 00000390

SOIL AMENDMENTS
00000311 00000313 00000321

SOIL ANALYSIS
00000309 00000311 00000313 00000321 00000340

SPINK CO., SD
00000383

SPOIL BANKS
00000316

SPOILS
00000308 00000309 00000313 00000314 00000315 00000319 00000320 00000321 00000326

SPOILS CHARACTERISTICS
00000326

SPOILS TREATMENTS
00000309 00000320 00000321

STABILIZATION
00000308 00000311 00000317

STACK EMISSIONS
00000340 00000345 00000346 00000347 00000350 00000351 00000352 00000378

STREAM DISCHARGE
00000324

STREAMFLOW
00000335 00000336

STRIP MINING
00000304 00000311 00000316 00000322

STRUCTURE CONTOUR MAPS
00000304

SULFUR
00000306 00000342

SULFUR DIOXIDE REMOVAL
00000350 00000351

SURFACE CONFIGURATIONS
00000308 00000317 00000321

SURFACE MINING
00000302 00000307 00000308 00000309 00000310 00000312 00000317 00000320 00000321 00000324 00000326
00000327 00000329 00000332 00000336 00000337 00000339 00000344 00000348 00000349 00000357 00000360
00000379 00000380 00000384

SURFACE RUNOFF
00000308 00000336

SURFACE WATER
00000335 00000336

SURFACE-GROUNDWATER RELATIONSHIP
00000336

SWEETWATER CO., WY
00000306 00000361 00000368

SYNTHETIC FUELS
00000363

SYNTHOL PROCESS
00000376

TECHNOLOGY ASSESSMENT
00000391

TONGUE RIVER BASIN
00000333 00000339

TONGUE RIVER RESERVOIR
00000332

TOPOGRAPHIC FEATURES
00000388

TRACE ELEMENTS
00000302 00000306 00000342

TRACT III
00000353

TRANSPORTATION SYSTEMS
00000310 00000367

TREASURE CO., MT
00000333 00000348 00000360

UNDERGRADUATE RESEARCH
00000303

URANIUM
00000388 00000390

URBAN DEVELOPMENT
00000343

VALUES CONFLICTS
00000330 00000338 00000357 00000389

VAN DE GRAAFF ACCELERATORS
00000303

VEGETATION TYPES
00000310 00000341 00000344 00000392 00000393

WATER FLOW
00000313 00000314 00000326

WATER PIPELINES
00000334

WATER POLLUTION
00000305 00000312 00000316

WATER QUALITY 00000316 00000322 00000324 00000327 00000331 00000333 00000335 00000336 00000339 00000363

WATER RESOURCES
SEE CHAPTER 1.3 AND:
00000305 00000308 00000317 00000343 00000363 00000388

WATER UTILIZATION 00000338

WATER WELLS 00000301 00000305 00000327

WESTON CO., WY 00000338 00000363

WHEATLAND, WY 00000361

WILDLIFE 00000310 00000344 00000353 00000354

WILDLIFE HABITATS 00000353 00000354 00000392

WIND ENERGY 00000303

WINTERIZATION 00000383

WOODY PLANTS 00000320

WYOMING HUMAN SERVICES PROJECT 00000361

YELLOWSTONE CO., MT 00000360

YELLOWSTONE RIVER BASIN 00000332 00000333 00000338 00000363 00000344

YOUNG'S CREEK, MT 00000329